

P170EM SERVICE MANUAL

Notebook Computer

P170EM

Service Manual

Notice

Version 1.0
April 2012

Trademarks

About this Manual

This manual is intended for service personnel who have completed sufficient training to undertake the maintenance and inspection of personal computers.

It is organized to allow you to look up basic information for servicing and/or upgrading components of the ***P170EM*** series notebook PC.

The following information is included:

Chapter 1, Introduction, provides general information about the location of system elements and their specifications.
Chapter 2, Disassembly, provides step-by-step instructions for disassembling parts and subsystems and how to upgrade elements of the system.

Appendix A, Part Lists
Appendix B, Schematic Diagrams
Appendix C, Updating the FLASH ROM BIOS

IMPORTANT SAFETY INSTRUCTIONS

Follow basic safety precautions, including those listed below, to reduce the risk of fire, electric shock and injury to persons when using any electrical equipment:

1. Do not use this product near water, for example near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement or near a swimming pool.
2. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
3. Do not use the telephone to report a gas leak in the vicinity of the leak.
4. Use only the power cord and batteries indicated in this manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for possible special disposal instructions.
5. This product is intended to be supplied by a Listed Power Unit with an AC Input of 100 - 240V, 50 - 60Hz, DC Output of 19V, 11.57A (**220** Watts) minimum AC/DC Adapter.

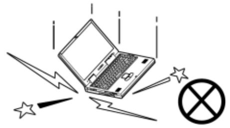
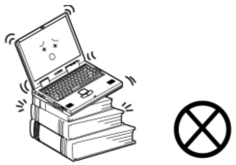
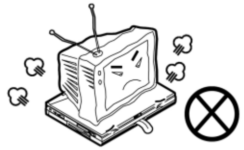
CAUTION

This Computer's Optical Device is a Laser Class 1 Product

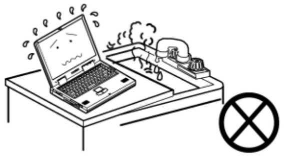
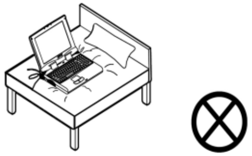
Instructions for Care and Operation

The notebook computer is quite rugged, but it can be damaged. To prevent this, follow these suggestions:

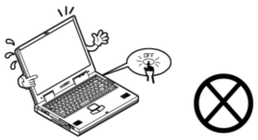
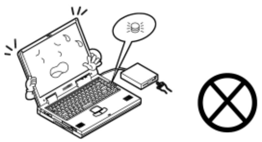
1. **Don't drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.

Do not expose the computer to any shock or vibration. 	*Do not place it on an unstable surface.* 	*Do not place anything heavy on the computer.* 

2. **Keep it dry, and don't overheat it.** Keep the computer and power supply away from any kind of heating element. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.

Do not expose it to excessive heat or direct sunlight. 	*Do not leave it in a place where foreign matter or moisture may affect the system.* 	*Don't use or store the computer in a humid environment.* 	*Do not place the computer on any surface which will block the vents.* 

3. **Follow the proper working procedures for the computer**. Shut the computer down properly and don't forget to save your work. Remember to periodically save your data as data may be lost if the battery is depleted.

Do not turn off the power until you properly shut down all programs. 	*Do not turn off any peripheral devices when the computer is on.* 	*Do not disassemble the computer by yourself.* 	*Perform routine maintenance on your computer.* 

Removal Warning

When removing any cover(s) and screw(s) for the purposes of device upgrade, remember to replace the cover(s) and screw(s) before restoring power to the system.

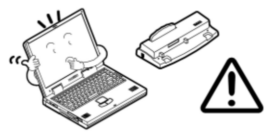
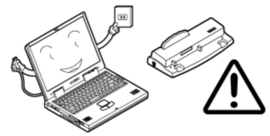
Also note the following when the cover is removed:

- Hazardous moving parts.
- Keep away from moving fan blades

Power Safety Warning

Before you undertake any upgrade procedures, make sure that you have turned off the power, and disconnected all peripherals and cables (including telephone lines and power cord). You must also remove your battery in order to prevent accidentally turning the machine on.

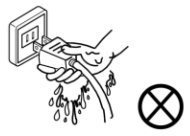
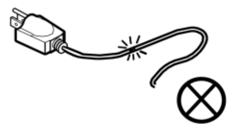
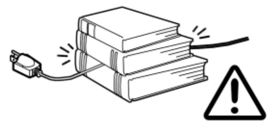
4. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.
5. **Take care when using peripheral devices**.

Use only approved brands of peripherals. 	*Unplug the power cord before attaching peripheral devices.* 

Power Safety

The computer has specific power requirements:

- Only use a power adapter approved for use with this computer.
- Your AC adapter may be designed for international travel but it still requires a steady, uninterrupted power supply. If you are unsure of your local power specifications, consult your service representative or local power company.
- The power adapter may have either a 2-prong or a 3-prong grounded plug. The third prong is an important safety feature; do not defeat its purpose. If you do not have access to a compatible outlet, have a qualified electrician install one.
- When you want to unplug the power cord, be sure to disconnect it by the plug head, not by its wire.
- Make sure the socket and any extension cord(s) you use can support the total current load of all the connected devices.
- Before cleaning the computer, make sure it is disconnected from any external power supplies.

Do not plug in the power cord if you are wet. 	*Do not use the power cord if it is broken.* 	*Do not place heavy objects on the power cord.* 

Battery Precautions

- Only use batteries designed for this computer. The wrong battery type may explode, leak or damage the computer.
- Do not continue to use a battery that has been dropped, or that appears damaged (e.g. bent or twisted) in any way. Even if the computer continues to work with a damaged battery in place, it may cause circuit damage, which may possibly result in fire.
- Recharge the batteries using the notebook's system. Incorrect recharging may make the battery explode.
- Do not try to repair a battery pack. Refer any battery pack repair or replacement to your service representative or qualified service personnel.
- Keep children away from, and promptly dispose of a damaged battery. Always dispose of batteries carefully. Batteries may explode or leak if exposed to fire, or improperly handled or discarded.
- Keep the battery away from metal appliances.
- Affix tape to the battery contacts before disposing of the battery.
- Do not touch the battery contacts with your hands or metal objects.

Battery Guidelines

The following can also apply to any backup batteries you may have.

- If you do not use the battery for an extended period, then remove the battery from the computer for storage.
- Before removing the battery for storage charge it to 60% - 70%.
- Check stored batteries at least every 3 months and charge them to 60% - 70%.

Battery Disposal

The product that you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its useful life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste officials for details in your area for recycling options or proper disposal.

Caution

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used battery according to the manufacturer's instructions.

Battery Level

Click the battery icon in the taskbar to see the current battery level and charge status. A battery that drops below a level of 10% will not allow the computer to boot up. Make sure that any battery that drops below 10% is recharged within one week.

Related Documents

You may also need to consult the following manual for additional information:

User's Manual on Disc

This describes the notebook PC's features and the procedures for operating the computer and its ROM-based setup program. It also describes the installation and operation of the utility programs provided with the notebook PC.

System Startup

1. Remove all packing materials.
2. Place the computer on a stable surface.
3. Insert the battery and tighten the screws.
4. Securely attach any peripherals you want to use with the computer (e.g. keyboard and mouse) to their ports.
5. Attach the AC/DC adapter to the DC-In jack at the rear of the computer, then plug the AC power cord into an outlet, and connect the AC power cord to the AC/DC adapter.
6. Use one hand to raise the lid/LCD to a comfortable viewing angle (do not to exceed **130** degrees); use the other hand (as illustrated in Figure 1) to support the base of the computer (**Note**: **Never** lift the computer by the lid/LCD).
7. Press the power button to turn the computer "on".

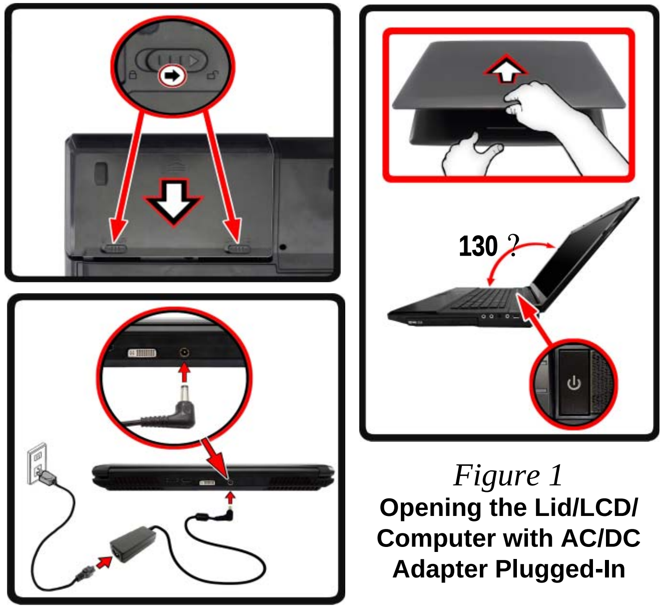


Figure 1
Opening the Lid/LCD/ Computer with AC/DC Adapter Plugged-In

Contents

Chapter 1: Introduction

Overview

This manual covers the information you need to service or upgrade the ***P170EM*** series notebook computer. Information about operating the computer (e.g. getting started, and the *Setup* utility) is in the *User's Manual*. Information about drivers (e.g. VGA & audio) is also found in *User's Manual*. That manual is shipped with the computer.

Operating systems (e.g. *Windows 7*, etc.) have their own manuals as do application software (e.g. word processing and database programs). If you have questions about those programs, you should consult those manuals.

The ***P170EM*** series notebook is designed to be upgradeable. See ***Disassembly on page 2 - 1*** for a detailed description of the upgrade procedures for each specific component. Please note the warning and safety information indicated by the “” symbol.

The balance of this chapter reviews the computer's technical specifications and features.

Specifications

Latest Specification Information

The specifications listed here are correct at the time of sending them to the press. Certain items (particularly processor types/speeds) may be changed, delayed or updated due to the manufacturer's release schedule. Check with your service center for more details.

CPU

The CPU is not a user serviceable part. Accessing the CPU in any way may violate your warranty.

Processor Options

Intel® Core™ i7 Processor

i7-3920XM (2.90GHz)

8MB L3 Cache, **22nm**, DDR3-1600MHz, TDP 55W

Intel® Core™ i7 Processor

i7-3820QM (2.70GHz)

8MB L3 Cache, **22nm**, DDR3-1600MHz, TDP 45W

i7-3720QM (2.60GHz) , i7-3610QM (2.30GHz)

6MB L3 Cache, **22nm**, DDR3-1600MHz, TDP 45W

i7-3520M (2.90GHz)

4MB L3 Cache, **22nm**, DDR3-1600MHz, TDP 35W

Intel® Core™ i5 Processor

i5-3360M (2.80GHz), i5-3320M (2.60GHz), i5-3210M (2.50GHz)

3MB L3 Cache, **22nm**, DDR3-1600MHz, TDP 35W

Intel® Core™ i7 Processor

i7-2960XM (2.70GHz)

8MB L3 Cache, **32nm**, DDR3-1600MHz, TDP 55W

Intel® Core™ i7 Processor

i7-2760QM (2.40GHz)

6MB L3 Cache, **32nm**, DDR3-1600MHz, TDP 45W

i7-2670QM (2.20GHz)

4MB L3 Cache, **32nm**, DDR3-1333MHz, TDP 45W

i7-2640M (2.80GHz)

4MB L3 Cache, **32nm**, DDR3-1333MHz, TDP 35W

Intel® Core™ i5 Processor

i5-2540M (2.60GHz), i5-2520M (2.50GHz)

3MB L3 Cache, **32nm**, DDR3-1333MHz, TDP 35W

Memory

***Four 204 Pin SO-DIMM Sockets Supporting DDR3 1333/1600** MHz Memory Modules

Memory Expandable up to 16GB

Compatible with 2GB or 4GB Modules

***Note: Four SO-DIMMs are only supported by Quad-Core CPUs; Dual-Core CPUs support two SO-DIMMs maximum

**Note: 1600 MHz Memory Modules are only supported by Quad-Core CPUs to a maximum of two SO-DIMMs

LCD

17.3" (46.94cm) FHD (1920 * 1080)

BIOS

AMI BIOS (48Mb SPI Flash-ROM)

Storage

One Changeable 2.5" (6cm) 9.5mm (h) **SATA** (Serial) Hard Disk Drives

(**Factory Option**) One 12.7mm(h) Optical Device Type Drive (Super Multi Drive/Blu-Ray Combo Drive/Blu-Ray Writer Drive)

(**Factory Option**) One mSATA Solid State Drive (SSD)

(**Factory Option**) Up to Two Changeable 2.5" (6cm) 9.5mm (h) **SATA** (Serial) Hard Disk Drives supporting RAID level 0/1/Recovery

Core Logic

Intel® HM77 Chipset

Video Adapter

Intel® Integrated GPU and NVIDIA® Discrete GPU

Supports NVIDIA® Optimus Technology

Intel Integrated GPU (GPU is Dependent on Processor)

<u>Intel® HD Graphics 3000</u>

Dynamic Frequency (Intel Dynamic Video Memory Technology for up to **1.7GB**)

Microsoft DirectX®10 Compatible

<u>Intel® HD Graphics 4000</u>

Dynamic Frequency (Intel Dynamic Video Memory Technology for up to **1.7GB**)

Microsoft DirectX®11 Compatible

nVIDIA® GeForce GTX 675M PCIe Video Card

2GB GDDR5 Video RAM on board

Microsoft DirectX® 11 Compatible

nVIDIA® GeForce GTX 670M PCIe Video Card

1.5GB GDDR5 Video RAM on board

Microsoft DirectX® 11 Compatible

Security

Security (Kensington® Type) Lock Slot
BIOS Password
(**Factory Option**) Fingerprint Reader Module

Audio

High Definition Audio Compliant Interface
THX TruStudio Pro
S/PDIF Digital Output
One (3W) Sub Woofer
Built-In Microphone
2 Speakers

Pointing Device

Built-in Touchpad (scrolling key functionality integrated)

Keyboard

Full-size “WinKey” keyboard with numeric keypad

Communication

Built-In Giga Base-TX Ethernet LAN
(**Factory Option**) 2.0M Pixel FHD PC Camera Module

WLAN/ Bluetooth Half Mini-Card Modules:

(**Factory Option**) Intel® Centrino® Ultimate-N 6300 Wireless LAN (**802.11a/g/n**)

(**Factory Option**) Intel® Centrino® Advanced-N 6235 Wireless LAN (**802.11a/g/n**) + Bluetooth **4.0**

(**Factory Option**) Intel® Centrino® Wireless-N 2230 Wireless LAN (**802.11a/g/n**) + Bluetooth **4.0**

(**Factory Option**) Wireless LAN (**802.11b/g/n**) + Bluetooth **3.0**

(**Factory Option**) Wireless LAN (**802.11b/g/n**) + Bluetooth **4.0**

Card Reader

Embedded Multi-In-1 Card Reader
- MMC (MultiMedia Card) / RS MMC
- SD (Secure Digital) / Mini SD / SDHC/ SDXC
- MS (Memory Stick) / MS Pro / MS Duo

Mini Card Slots

Slot 1 for **WLAN** Module or **Combo WLAN and Bluetooth** Module
(**Factory Option**) Slot 2 for **mSATA SSD**

Interface

Three USB 3.0 Ports (Including one AC/DC Powered USB/ eSATA port)
One USB 2.0 Port
One eSATA Port (USB 3.0 Port Combined)
One HDMI-Out (1.4a) Port
One DVI-Out Port
One S/PDIF Out Jack
One Headphone/Speaker-Out Jack
One Microphone-In Jack
One Line-In Jack
One Mini-IEEE1394b Port
One RJ-45 LAN Jack
One Display (1.1a) Port
One DC-In Jack

Note: External 7.1CH Audio Output Supported by Headphone, Microphone, Line-In and Surround-Out Jacks

Environmental Spec

Temperature
Operating: 5°C - 35°C
Non-Operating: -20°C - 60°C
Relative Humidity
Operating: 20% - 80%
Non-Operating: 10% - 90%

Power

Removable 8-cell cylinder battery, 76.96Wh (5200mAh)
Full Range AC/DC Adapter
AC Input: 100 - 240V, 50 - 60Hz
DC Output: 19V, 11.57A (**220W**)

Dimensions & Weight

412mm (w) * 276mm (d) * 41.8 - 45.4mm (h)
Around 3.9kg with Battery and ODD

External Locator - Top View with LCD Panel Open

Figure 1
Top View

1. PC Camera
2. LCD
3. LED Status Indicators
4. Power Button
5. Speakers
6. Keyboard
7. Built-In Microphone
8. TouchPad and Buttons
9. Fingerprint Reader (**Optional**)



External Locator - Front & Right side Views



Figure 2
Front Views

1. LED Power Indicators



Figure 3
Right Side Views

1. Optical Device Drive Bay
2. Emergency Eject Hole
3. Headphone Jack
4. Microphone Jack
5. S/PDIF-Out Jack
6. Line-In Jack
7. USB 2.0 Port

External Locator - Left Side & Rear View

Figure 4
Left Side View

1. Mini-IEEE 1394a Port
2. RJ-45 LAN Jack
3. USB 3.0 Port / USB Charge
4. USB 3.0 Port
5. Combined eSATA/ Powered USB 3.0 Port
6. Multi-in-1 Card Reader



Figure 5
Rear View

1. Vent/Fan Intake
2. Display Port
3. HDMI-Out Port
4. DVI-Out Port
5. DC-In Jack
6. Security Lock Slot



External Locator - Bottom View

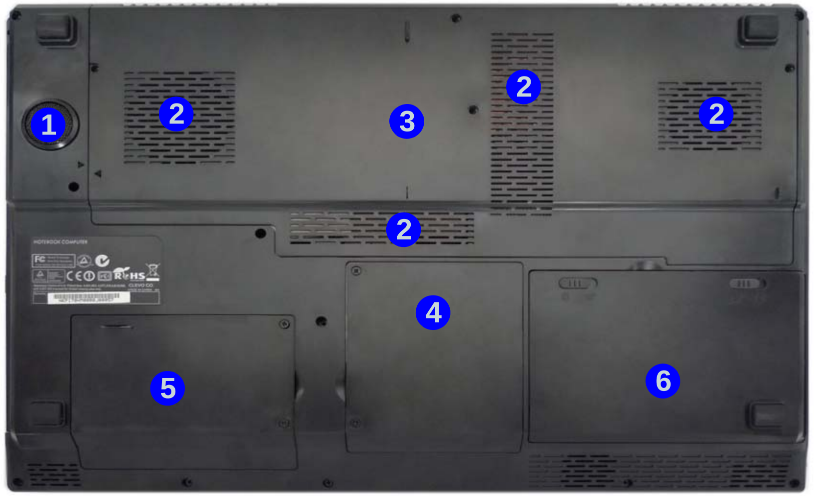


Figure 6
Bottom View

1. Sub Woofer
2. Fan Outlet/Intake
3. Component Bay Cover
4. Primary HDD Bay
5. Secondary HDD Bay
6. Battery

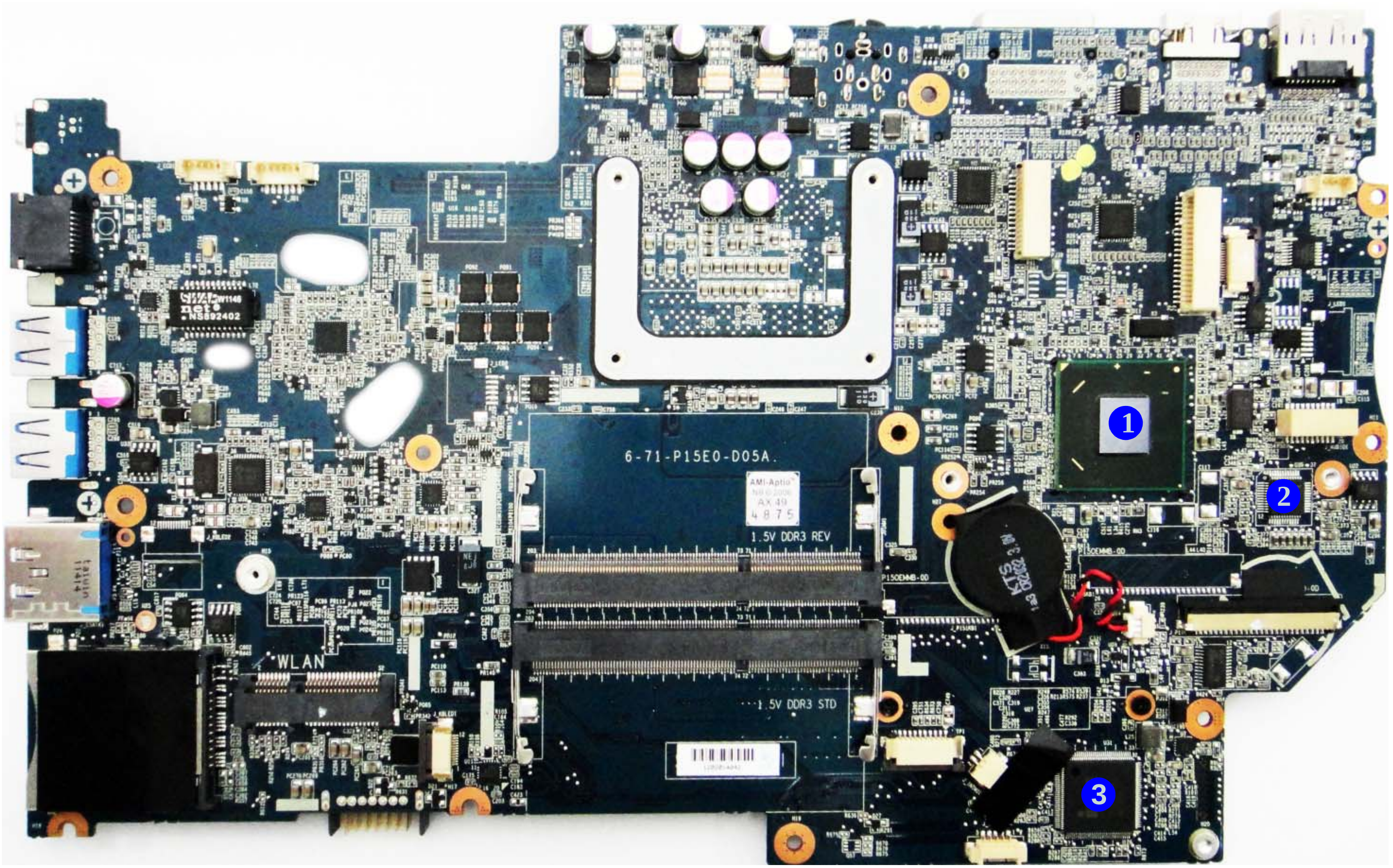
Overheating

To prevent your computer from overheating make sure nothing blocks the vent/fan intakes while the computer is in use.

Mainboard Overview - Top (Key Parts)

Figure 7
Mainboard Top Key Parts

1. Platform Controller Hub
2. Audio Codec
3. KBC ITE IT8519E



Mainboard Overview - Bottom (Key Parts)

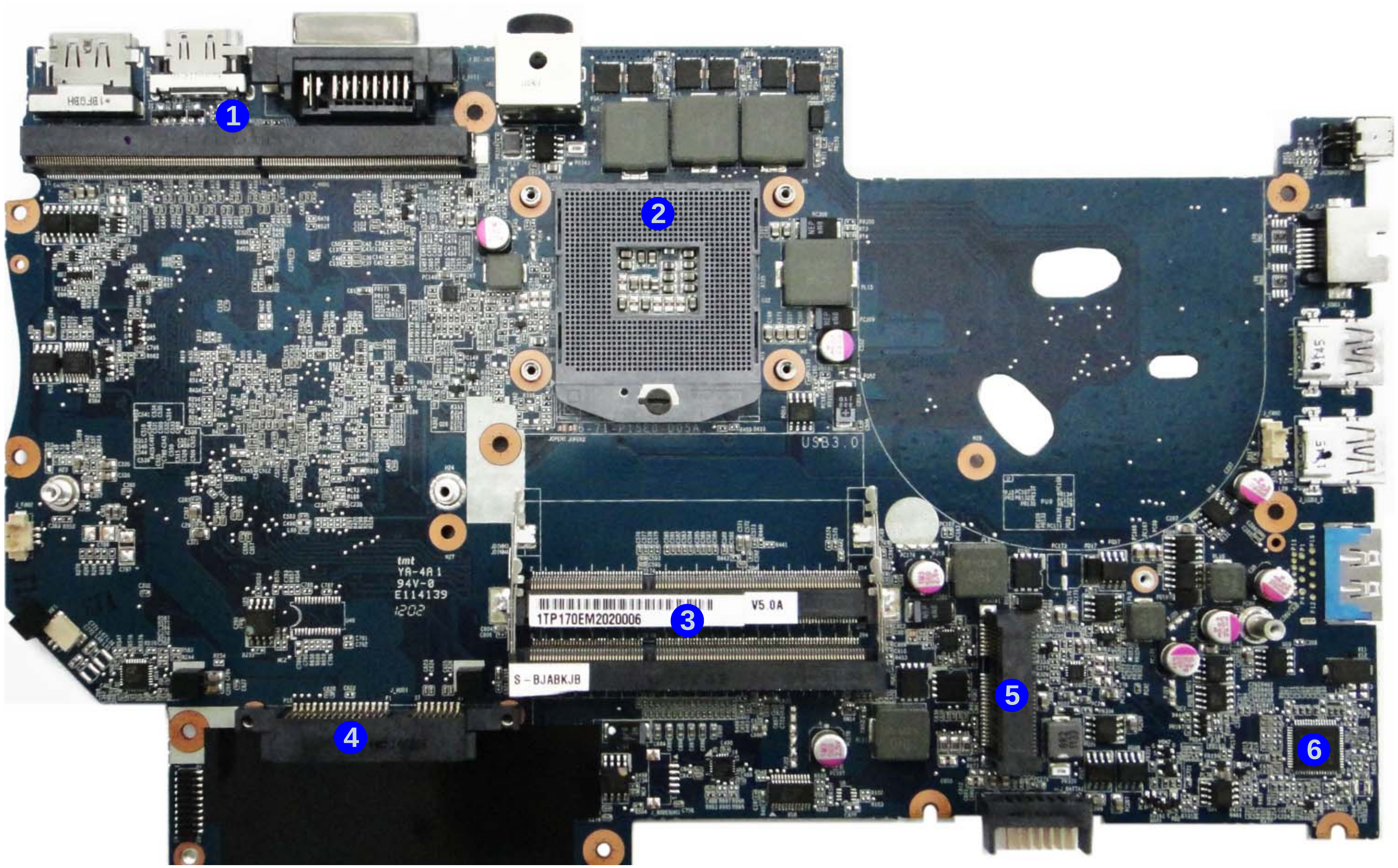


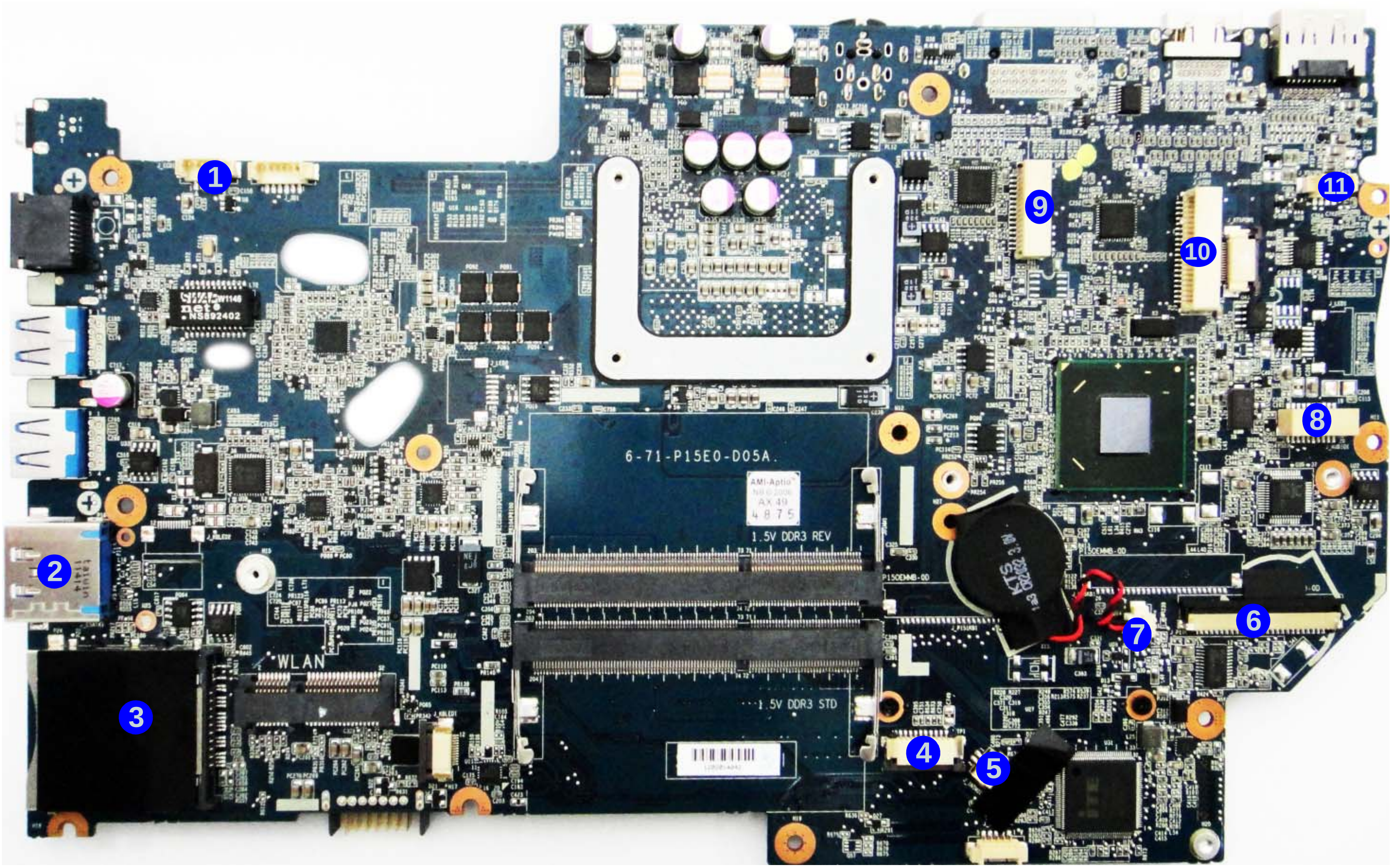
Figure 8
Mainboard Bottom Key Parts

1. VGA-Card Connector
2. CPU Socket (no CPU installed)
3. Memory Slots DDR3 SO-DIMM
4. Hard Disk Connector
5. Mini-Card MSATA Connector
6. RTL8411

Mainboard Overview - Top (Connectors)

Figure 9
Mainboard Top Connectors

1. CCD Connector
2. USB 3.0 Port / eSATA
3. Multi-in-1 Card Reader
4. TouchPad Cable Connector
5. Microphone Cable Connector
6. Keyboard Cable Connector
7. CMOS Battery Connector
8. Audio Cable Connector
9. LCD Cable Connector 2
10. LCD Cable Connector 1
11. Speaker Connector



Mainboard Overview - Bottom (Connectors)

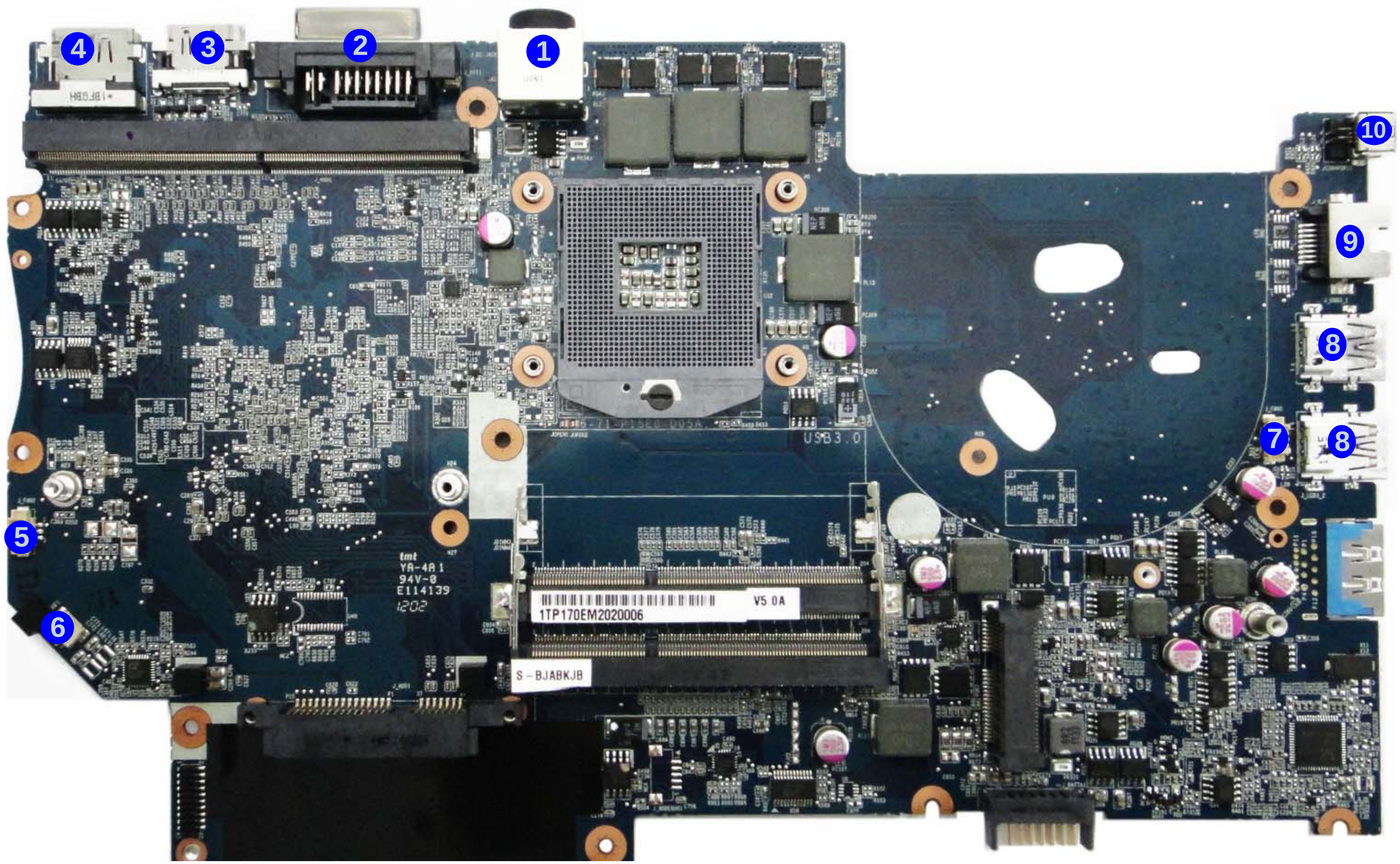


Figure 10
Mainboard Bottom Connectors

1. DC-In Jack
2. DVI-Out Port
3. HDMI-Out Port
4. Display Port
5. VGA Fan Cable Connector
6. Sub Woofer Cable Connector
7. CPU Fan Cable Connector
8. USB 3.0 Ports
9. RJ-45 LAN Jack
10. Mini-IEEE 1394a Port

Chapter 2: Disassembly

Overview

This chapter provides step-by-step instructions for disassembling the ***P170EM*** series notebook's parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

We suggest you completely review any procedure before you take the computer apart.

Procedures such as upgrading/replacing the RAM, optical device and hard disk are included in the User's Manual but are repeated here for your convenience.

To make the disassembly process easier each section may have a box in the page margin. Information contained under the figure # will give a synopsis of the sequence of procedures involved in the disassembly procedure. A box with a lists the relevant parts you will have after the disassembly process is complete. **Note**: The parts listed will be for the disassembly procedure listed ONLY, and not any previous disassembly step(s) required. Refer to the part list for the previous disassembly procedure. The amount of screws you should be left with will be listed here also.

A box with a will also provide any possible helpful information. A box with a contains warnings.

An example of these types of boxes are shown in the sidebar.

Information

Warning

NOTE: All disassembly procedures assume that the system is turned **OFF**, and disconnected from any power supply (the battery is removed too).

Maintenance Tools

The following tools are recommended when working on the notebook PC:

- M3 Philips-head screwdriver
- M2.5 Philips-head screwdriver (magnetized)
- M2 Philips-head screwdriver
- Small flat-head screwdriver
- Pair of needle-nose pliers
- Anti-static wrist-strap

Connections

Connections within the computer are one of four types:

Locking collar sockets for ribbon connectors	To release these connectors, use a small flat-head screwdriver to gently pry the locking collar away from its base. When replacing the connection, make sure the connector is oriented in the same way. The pin1 side is usually not indicated.
Pressure sockets for multi-wire connectors	To release this connector type, grasp it at its head and gently rock it from side to side as you pull it out. Do not pull on the wires themselves. When replacing the connection, do not try to force it. The socket only fits one way.
Pressure sockets for ribbon connectors	To release these connectors, use a small pair of needle-nose pliers to gently lift the connector away from its socket. When replacing the connection, make sure the connector is oriented in the same way. The pin1 side is usually not indicated.
Board-to-board or multi-pin sockets	To separate the boards, gently rock them from side to side as you pull them apart. If the connection is very tight, use a small flat-head screwdriver - use just enough force to start.

Maintenance Precautions

The following precautions are a reminder. To avoid personal injury or damage to the computer while performing a removal and/or replacement job, take the following precautions:

1. **Don't drop it**. Perform your repairs and/or upgrades on a stable surface. If the computer falls, the case and other components could be damaged.
2. **Don't overheat it**. Note the proximity of any heating elements. Keep the computer out of direct sunlight.
3. **Avoid interference**. Note the proximity of any high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage components and/or data. You should also monitor the position of magnetized tools (i.e. screwdrivers).
4. **Keep it dry**. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.
5. **Be careful with power**. Avoid accidental shocks, discharges or explosions.
   - Before removing or servicing any part from the computer, turn the computer off and detach any power supplies.
   - When you want to unplug the power cord or any cable/wire, be sure to disconnect it by the plug head. Do not pull on the wire.
6. **Peripherals** – Turn off and detach any peripherals.
7. **Beware of static discharge**. ICs, such as the CPU and main support chips, are vulnerable to static electricity. Before handling any part in the computer, discharge any static electricity inside the computer. When handling a printed circuit board, do not use gloves or other materials which allow static electricity buildup. We suggest that you use an anti-static wrist strap instead.
8. **Beware of corrosion**. As you perform your job, avoid touching any connector leads. Even the cleanest hands produce oils which can attract corrosive elements.
9. **Keep your work environment clean**. Tobacco smoke, dust or other air-born particulate matter is often attracted to charged surfaces, reducing performance.
10. **Keep track of the components**. When removing or replacing any part, be careful not to leave small parts, such as screws, loose inside the computer.

Cleaning

Do not apply cleaner directly to the computer, use a soft clean cloth.
Do not use volatile (petroleum distillates) or abrasive cleaners on any part of the computer.

Power Safety Warning

Before you undertake any upgrade procedures, make sure that you have turned off the power, and disconnected all peripherals and cables (including telephone lines and power cord). You must also remove your battery in order to prevent accidentally turning the machine on.

Disassembly Steps

The following table lists the disassembly steps, and on which page to find the related information. **PLEASE PERFORM THE DISASSEMBLY STEPS IN THE ORDER INDICATED.**

To remove the Battery:

1. Remove the battery *page 2 - 5*

To remove the HDD from the Primary Bay:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 6*

To remove the Optical Device:

1. Remove the battery *page 2 - 5*
2. Remove the Optical device *page 2 - 9*

To remove the HDD from the Secondary Bay:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 10*

To remove the Primary System Memory:

1. Remove the battery *page 2 - 5*
2. Remove the system memory *page 2 - 12*

To remove the Secondary System Memory:

1. Remove the battery *page 2 - 5*
2. Remove the keyboard *page 2 - 14*
3. Remove the system memory *page 2 - 15*

To remove the WLAN Module:

1. Remove the battery *page 2 - 5*
2. Remove the keyboard *page 2 - 14*
3. Remove the wireless LAN *page 2 - 16*

To remove and install a Processor:

1. Remove the battery *page 2 - 5*
2. Remove the processor *page 2 - 17*
3. Install the processor *page 2 - 19*

To remove and install a Video Card:

1. Remove the battery *page 2 - 5*
2. Remove the video card *page 2 - 20*
3. Install the video card *page 2 - 21*

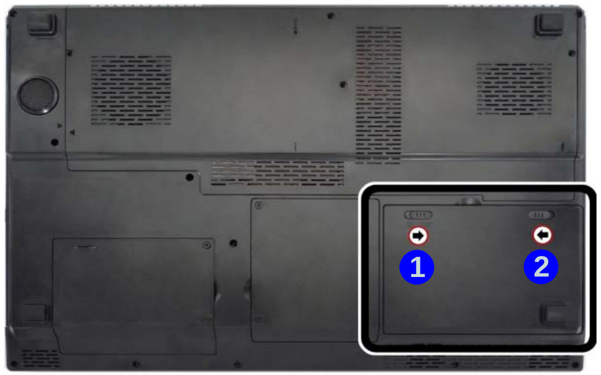
To remove the Microphone:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 6*
3. Remove the Optical device *page 2 - 9*
4. Remove the HDD *page 2 - 10*
5. Remove the system memory *page 2 - 12*
6. Remove the processor *page 2 - 17*
7. Remove the video card *page 2 - 20*
8. Remove the microphone *page 2 - 22*

Removing the Battery

1. Turn the computer **off**, and turn it over.
2. Slide the latch 1 in the direction of the arrow (***Figure 1a***).
3. Slide the latch 2 in the direction of the arrow, and hold it in place (***Figure 1a***).
4. The battery may be levered up at point 3 (***Figure 1b***).
5. Lift the battery 4 out of the compartment (***Figure 1c***).

a.



b.



c.

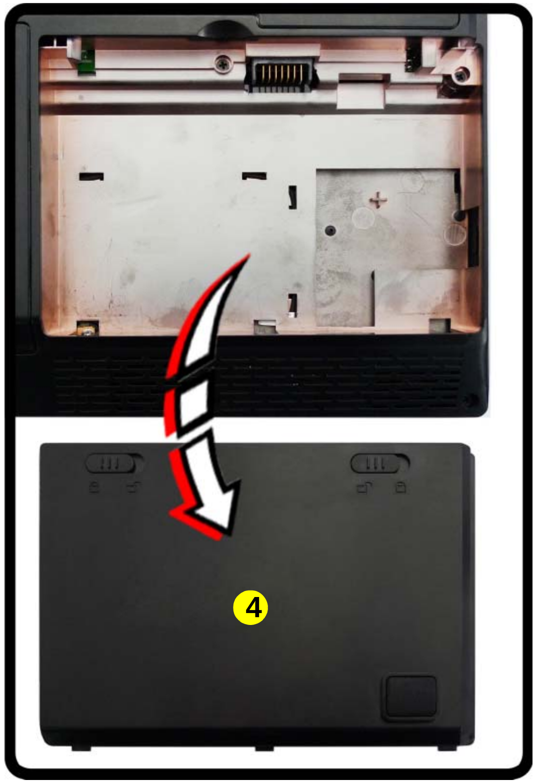


Figure 1
Battery Removal

a. Slide the latch and hold in place.
b. Slide the battery out in the direction of the arrow.
c. Lift the battery out.

4. Battery

2.Disassembly

Removing the Hard Disk Drive

Figure 2
HDD Assembly Removal

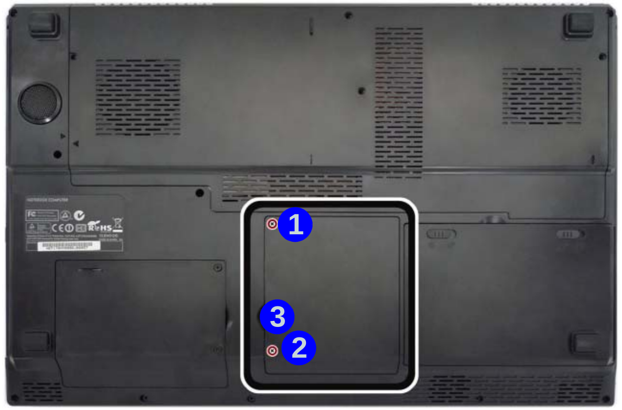
a. Locate the HDD bay cover and remove the screws.
b. Remove the hard disk bay cover by levering the cover at point 3.

The hard disk drive can be taken out to accommodate other 2.5" serial (SATA) hard disk drives with a height of 9.5mm (h). Follow your operating system's installation instructions, and install all necessary drivers and utilities (as outlined in **Chapter 4 of the User's Manual**) when setting up a new hard disk.

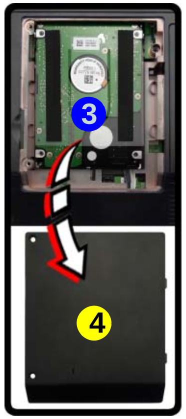
Hard Disk Upgrade Process

1. Turn **off** the computer, and remove the battery (***page 2 - 5***).
2. Locate the hard disk bay cover and remove screws 1 - 2 (***Figure 2a***).
3. Remove the hard disk bay cover 4 by levering the cover at point 3 (***Figure 2b***).

a.



b.



4.Hard Disk Bay Cover

- 2 Screws

HDD System Warning

New HDD's are blank. Before you begin make sure:

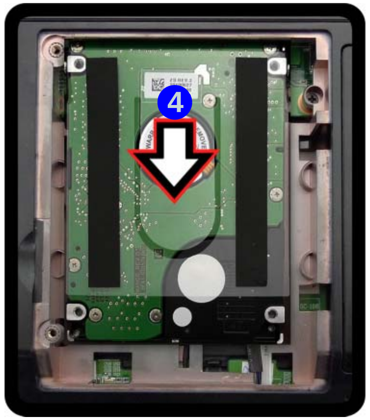
You have backed up any data you want to keep from your old HDD.

You have all the CD-ROMs and FDDs required to install your operating system and programs.

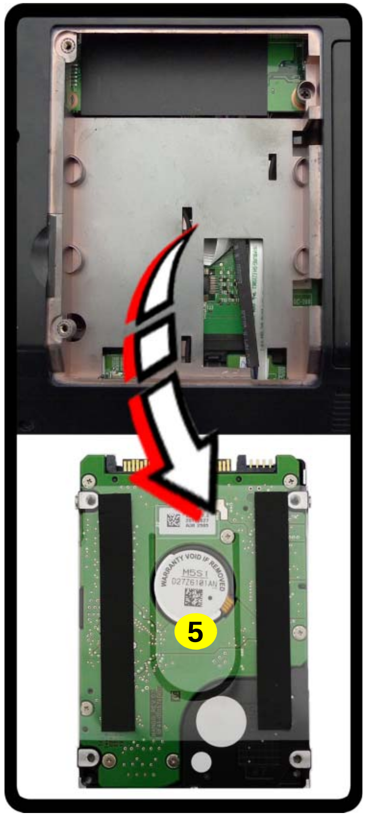
If you have access to the internet, download the latest application and hardware driver updates for the operating system you plan to install. Copy these to a removable medium.

4. Slide the HDD assembly in the direction of the arrow 4 (*Figure 3c*).
5. Remove the hard disk assembly 5 (*Figure 3d*).
6. Remove screws 6 & 7 and the insulation plate 8 (*Figure 3e*).
7. Reverse the process to install a new hard disk (do not forget to replace all the screws and covers).

c.



d.



e.

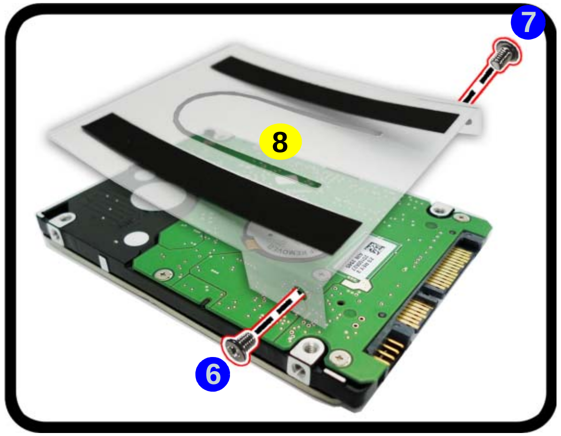


Figure 3
HDD Assembly Removal (cont'd.)

c. Slide the HDD assembly in the direction of the arrow.
d. Remove the hard disk assembly.
e. Remove the screws and the insulation plate.

5. HDD
8. HDD Insulation Plate

- 2 Screws

Figure 4
Inserting the Hard Disk Into the HDD Bay

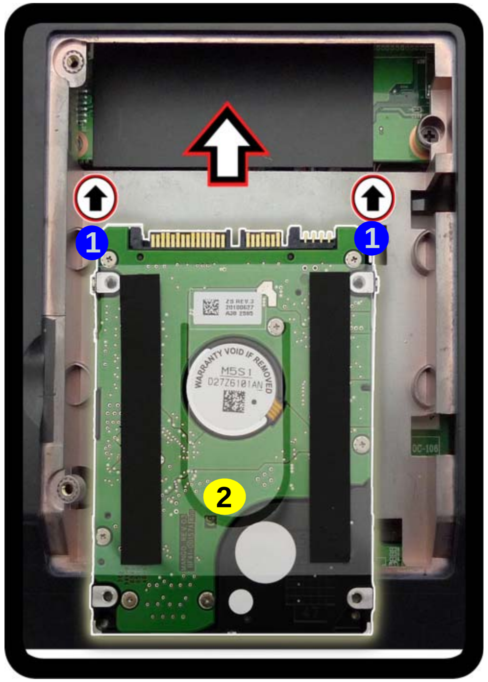
a. Make sure the HDD assembly is aligned with the black taped area. When aligned, carefully insert the HDD assembly into the case so that the connectors line up.

2. HDD

Inserting the Hard Disk Into the HDD Bay

1. Make sure the HDD assembly is aligned with the black taped area 1 (*Figure 4a*).
2. When aligned, carefully insert the HDD assembly 2 into the case so that the connectors line up (*Figure 4a*).
3. Replace the hard disk bay covers and screws.

a.



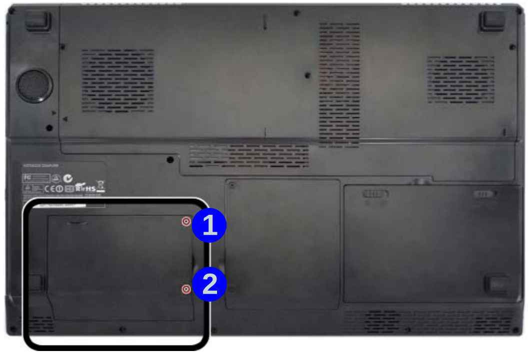
Removing the Optical (CD/DVD) Device

1. Turn **off** the computer, and remove the battery (***page 2 - 5***).
2. Locate the **secondary** hard disk bay cover and remove screws 1 & 2 (***Figure 5a***).
3. Remove the hard disk bay cover 3 (***Figure 5b***).
4. Remove the screw at point 4 (***Figure 5c***), and use a screwdriver to carefully push out the optical device 5 out of the bay at point 6 (***Figure 5d***).
5. Reverse the process to install any new optical (CD/DVD) device.

Figure 5
Optical Device Removal

a. Locate the secondary hard disk bay cover and remove the screws.
b. Remove the cover.
c. Remove the screw.
d. Push the optical device out off the computer at point 6.

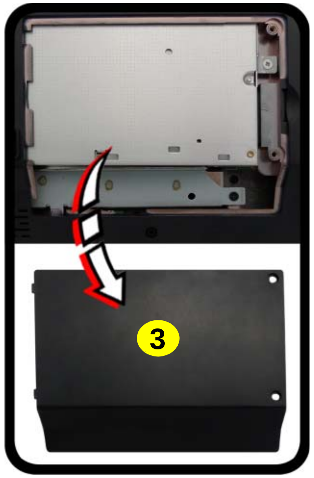
a.



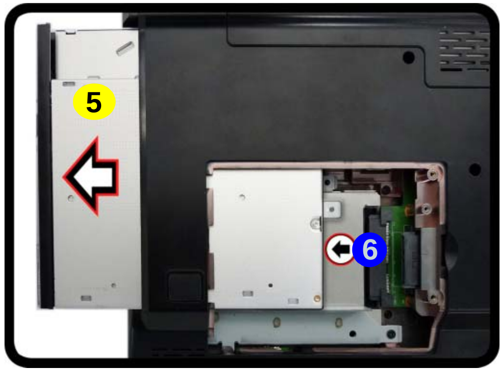
c.



b.



d.



3. Secondary HDD Bay Cover
5. Optical Device

- 3 Screws

Removing the Hard Disk from the Secondary HDD Bay

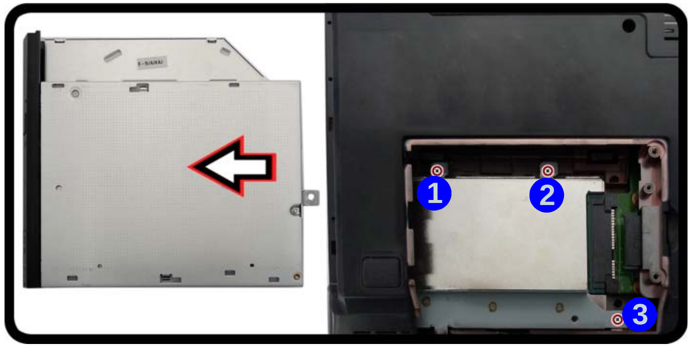
Note that the **secondary** hard disk (if installed) is located under the optical device bay (CD/DVD).

1. Turn **off** the computer, and turn it over, remove the battery (***page 2 - 5***) and optical device (***page 2 - 9***).
2. Remove screws 1 - 3 from the secondary HDD assembly (***Figure 6a***).
3. Slide the secondary HDD assembly in the direction of the arrow 4 (it will not move fully out of the bay ***Figure 6a***).
4. Lift the secondary HDD assembly 5 up and out of the bay (in the reverse direction of the arrow 4 ***Figure 6c***).

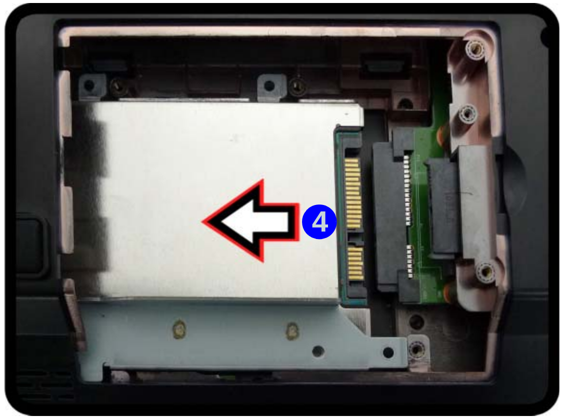
Figure 6
Secondary HDD Assembly Removal

a. Remove the screws from the secondary HDD assembly.
b. Slide the secondary HDD assembly in the direction of the arrow.
c. Lift the secondary HDD assembly up and out of the bay.

a.



b.



c.



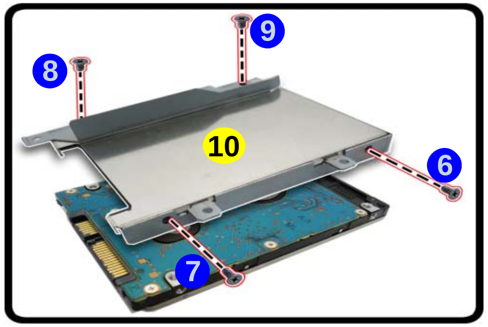
5. Hard Disk Assembly

- 3 Screws

2.Disassembly

5. Remove screws 6 - 9 and the insulation plate 10 (*Figure 7d*).

d.



6. Reverse the process to install a new disk (make sure you install the insulation plate).
7. Slide the HDD assembly into the bay at an angle as illustrated.
8. Make sure the insulation plate slides under the HDD bay guide at point 11.
9. Slide the assembly in the direction of the arrow 12 and secure the assembly with the screws.



Figure 7
Secondary HDD Assembly Removal

d. Remove the screws and the insulation plate.

10. HDD Insulation Plate

- 4 Screws

Figure 8
RAM Module Removal

a. Remove the screws.
b. Slide the bottom cover until the cover and case indicators are aligned.

Removing the Primary System Memory (RAM)

The computer has **four** memory sockets for 204 pin Small Outline Dual In-line (SO-DIMM) **DDR III (DDR3)** type memory modules (see ***"Memory" on page 1 - 2***). The total memory size is automatically detected by the POST routine once you turn on your computer.

Note that **four SO-DIMMs are only supported by Quad-Core CPUs**; **Dual-Core CPUs support two SO-DIMMs maximum (see *"Memory" on page 1 - 2* for full details).**

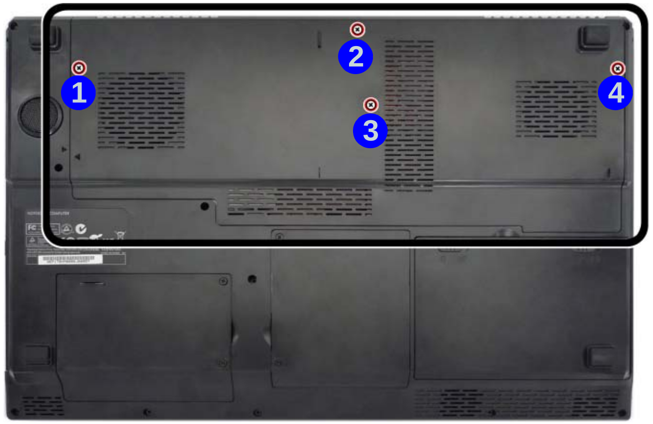
Two primary memory sockets are located under component bay cover (the bottom case cover), and two secondary memory sockets are located under the keyboard (not user upgradable). If you are installing only two RAM modules then they should be installed in the primary memory sockets under the component bay cover.

Note that the RAM located under the keyboard is not user upgradable. Contact your service center for more information if you wish to upgrade the memory in the secondary memory sockets.

Memory Upgrade Process

1. Turn **off** the computer, and turn it over, remove the battery (***page 2 - 5***).
2. Remove screws 1 - 4 (***Figure 8a***).
3. Slide the bottom cover until the cover and case indicators 5 are aligned (***Figure 8b***).

a.



b.



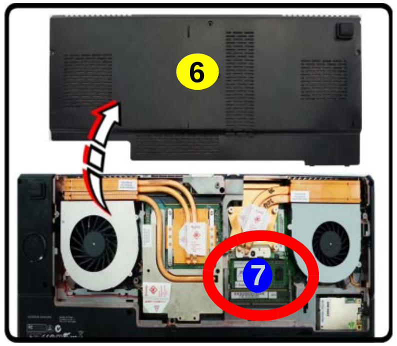
- 4 Screws

4. Lift the component bay cover 6 off the computer case. The modules will be visible at point 7 (***Figure 9c***).
5. Gently pull the two release latches (8 & 9) on the sides of the memory socket(s) in the direction indicated below (***Figure 9d***).
6. The RAM module 10 will pop-up, and you can remove it (***Figure 9e***).
7. Pull the latches to release the second module if necessary.
8. Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.
9. The module's pin alignment will allow it to only fit one way. Make sure the module is seated as far into the slot as it will go. DO NOT FORCE the module; it should fit without much pressure.
10. Press the module in and down towards the mainboard until the slot levers click into place to secure the module.
11. Replace the bay cover and screws.
12. Restart the computer to allow the BIOS to register the new memory configuration as it starts up.

Figure 9
RAM Module Removal (cont'd.)

c. Lift the component bay cover off the computer case. The modules will be visible at point 7.
d. Gently pull the two release latches on the sides of the memory socket(s) in the direction indicated below.
e. The RAM module will pop-up, and you can remove it.

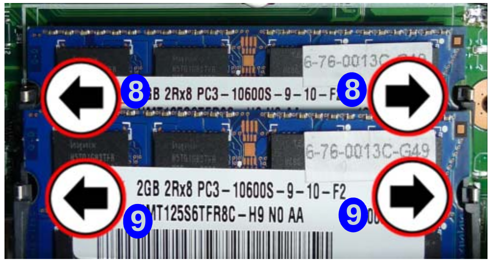
c.



e.



d.



Contact Warning

Be careful not to touch the metal pins on the module's connecting edge. Even the cleanest hands have oils which can attract particles, and degrade the module's performance.

6. Component Bay Cover
10. RAM Module

2.Disassembly

Removing the Secondary System Memory (RAM)

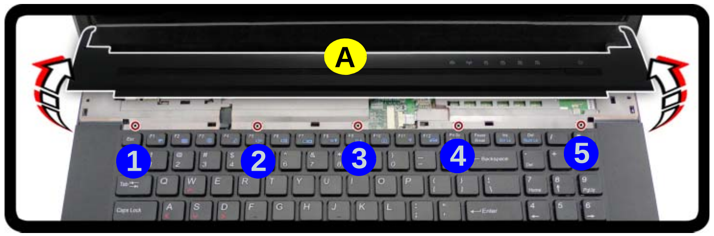
Figure 10
RAM Module Removal

a. Remove the top cover module.
b. Remove the screws.
c. Carefully lift the keyboard up, being careful not to bend the keyboard ribbon cable.

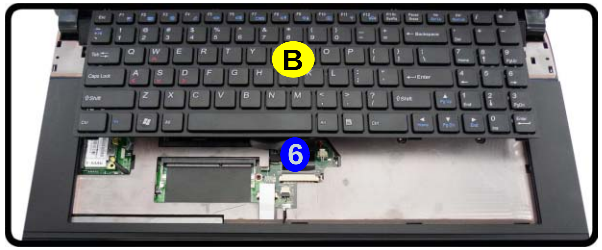
Memory Upgrade Process

1. Turn **off** the computer, and turn it over, remove the battery (***page 2 - 5***) and the component bay cover.
2. Remove the top cover module **A** (***Figure 10a***).
3. Remove screws **1** - **5** (***Figure 10a***).
4. Carefully lift the keyboard **B** up, being careful not to bend the keyboard ribbon cable **6** (***Figure 10c***).

a.



b.



A. Top Cover Module
B. Keyboard

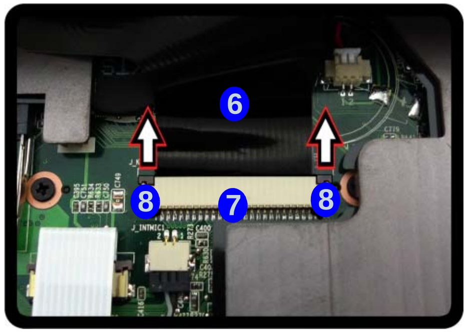
- 5 Screws

5. Disconnect the keyboard ribbon cable 6 from the locking collar socket 7 by using a small flat-head screwdriver to pry the locking collar pins 8 away from the base. (***Figure 11e***).
6. Remove the keyboard and the memory sockets 9 & 10 will be visible (***Figure 11f***).
7. Gently pull the two release latches (11 & 12) on the sides of the memory socket(s) in the direction indicated below (***Figure 11g***).
8. The RAM module 13 will pop-up, and you can remove it.
9. Pull the latches to release the second module if necessary.
10. Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.
11. The module's pin alignment will allow it to only fit one way. Make sure the module is seated as far into the slot as it will go. DO NOT FORCE the module; it should fit without much pressure.
12. Press the module in and down towards the mainboard until the slot levers click into place to secure the module.
13. Replace the bay cover and screws.
14. Restart the computer to allow the BIOS to register the new memory configuration as it starts up.

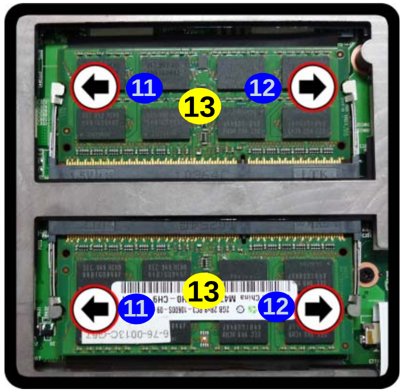
Figure 11
RAM Module Removal (cont'd.)

e. Disconnect the keyboard ribbon cable from the locking collar socket by using a small flat-head screwdriver to pry the locking collar pins away from the base.
f. Remove the keyboard and the memory sockets will be visible.
g. Gently pull the two release latches on the sides of the memory socket(s) in the direction indicated below.

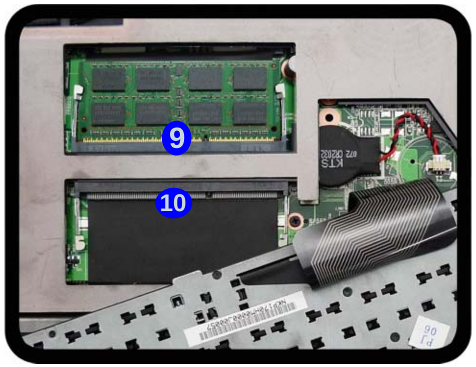
e.



g.



f.



Contact Warning

Be careful not to touch the metal pins on the module's connecting edge. Even the cleanest hands have oils which can attract particles, and degrade the module's performance.

13. RAM Modules

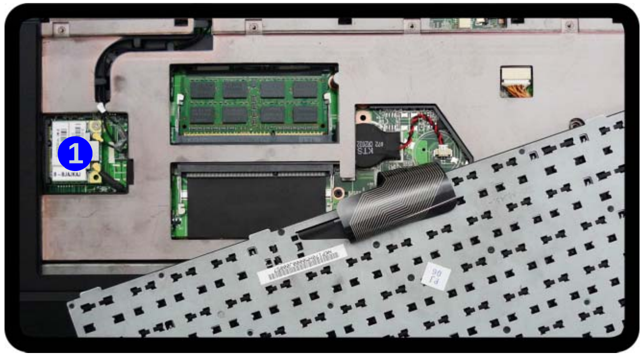
Figure 12
Wireless LAN Module Removal

a. The Wireless LAN module will be visible at point 1 under the keyboard
b. Disconnect the cables and remove the screw.
c. The WLAN module will pop up.
d. Lift the WLAN module out.

Removing the Wireless LAN Module

1. Turn **off** the computer, remove the battery (***page 2 - 5***) and the keyboard (***page 2 - 10***).
2. The Wireless LAN module will be visible at point 1 under the keyboard (***Figure 12a***).
3. Carefully disconnect cables 2 - 3, then remove screw 4 from the module socket (***Figure 12b***).
4. The Wireless LAN module 5 will pop-up (***Figure 12c***).
5. Lift the Wireless LAN module (***Figure 12d***) up and off the computer.

a.



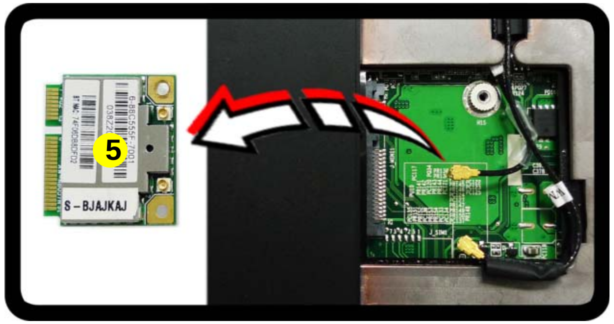
c.



b.



d.



5. WLAN Module

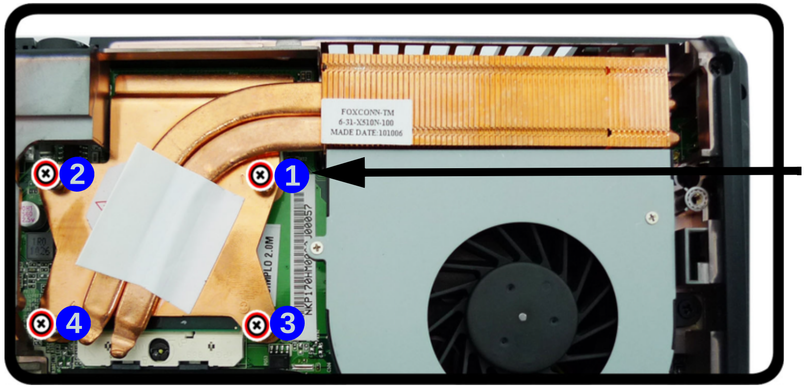
- 1 Screw

Removing and Installing the Processor

Processor Removal Procedure

1. Turn **off** the computer, remove the battery (***page 2 - 5***), and component bay cover (***page 2 - 10***).
2. Remove screws 1 - 4 from the heat sink unit in the order indicated on the label (i.e screw 4 first through to screw 1 last ***Figure 13a***).
3. Carefully (it may be hot) remove the heat sink unit 5 (***Figure 13b***).

a.



Note: Loosen the screws in the reverse order 4-3-2-1 as indicated on the label.

b.



Figure 13
Processor Removal Procedure

a. Remove the screws in the correct order.
b. Carefully remove the heat sink unit.

CPU Warning

In order to prevent damaging the contact pins when removing the CPU, it is necessary to first remove the WLAN module from the computer.

5. Heat Sink Unit

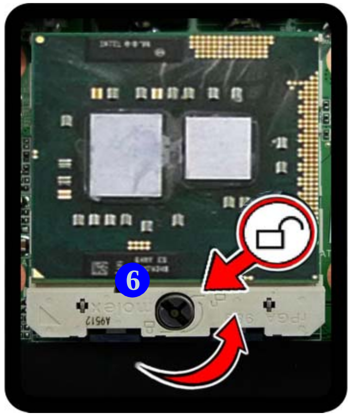
- 4 Screws

Figure 14
Processor Removal (cont'd)

c. Turn the release latch to unlock the CPU.
d. Lift the CPU out of the socket.

4. Turn the release latch 6 towards the unlock symbol, to release the CPU (***Figure 14c***).
5. Carefully (it may be hot) lift the CPU A up out of the socket (***Figure 14d***).
6. See ***page 2 - 19*** for information on inserting a new CPU.
7. When re-inserting the CPU, pay careful attention to the pin alignment, it will fit only one way (DO NOT FORCE IT!).

c.

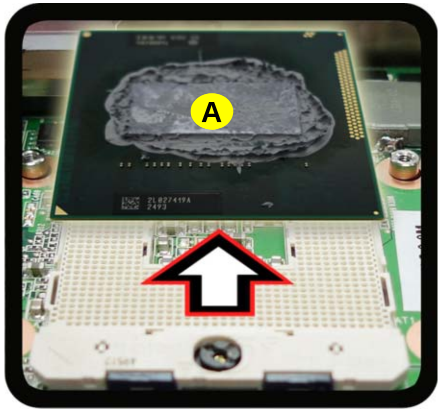


Unlock



Lock

d.



Caution

The heat sink, and CPU area in general, contains parts which are subject to high temperatures. Allow the area time to cool before removing these parts.

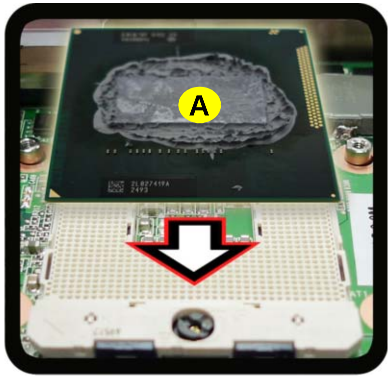
A. CPU

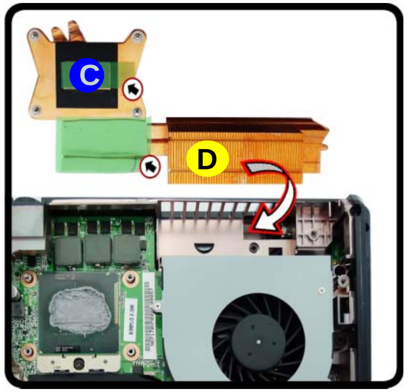
Processor Installation Procedure

1. Insert the CPU **A**, pay careful attention to the pin alignment (***Figure 15a***), it will fit only one way (DO NOT FORCE IT!), and turn the release latch **B** towards the lock symbol 🔒 (***Figure 15b***).
2. **Remove the sticker C** (***Figure 15c***) from the heat sink unit.
3. Insert the heat sink unit **D** as indicated in ***Figure 15c***.
4. Tighten the CPU heat sink screws in the order 1, 2, 3 & 4 (the order as indicated on the label and ***Figure 15d***).
5. Replace the CPU fan, component bay cover and tighten the screws (***page 2 - 17***).

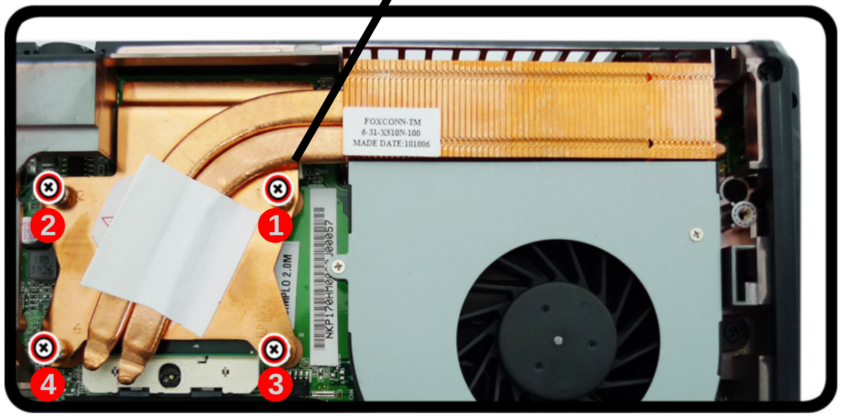
Figure 15
Processor Installation

a. Insert the CPU.
b. Turn the release latch towards the lock symbol.
c. Remove the sticker from the heat sink unit and insert the heat sink.
d. Tighten the screws.

a.


c.


b.


d.


Note:

Tighten the screws in the order 1-2-3-4 as indicated on the label.

A. CPU
D. Heat Sink

- 4 Screws

Removing and Installing the Video Card

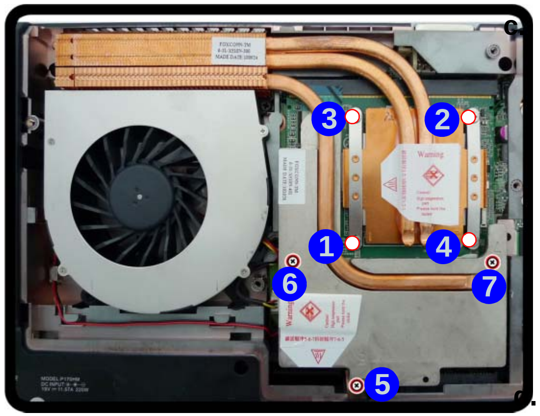
Video Card Removal Procedure

1. Turn **off** the computer, turn it over and remove the battery (*page 2 - 5*) and component cover (*page 2 - 10*).
2. Remove screws 1 - 7 from the heat sink unit in the order indicated on the label (i.e screw **7** first through to screw **1** last) (*Figure 16a*).
3. Carefully (**they may be hot**) remove the heat sink units 8 & 9 (*Figure 16b*).
4. Remove screws 10 & 11 from the video card and the video card 12 will pop up (*Figure 16c*).
5. Remove the video card 12 (*Figure 16d*).

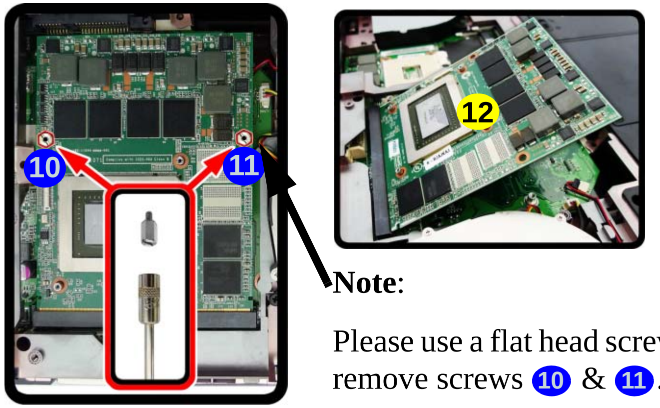
Figure 16
Video Card Removal Procedure

a. Remove the screws in the correct order.
b. Carefully remove the heat sink units.
c. Remove the video card screws. The video card will pop up.
d. Remove the video card.

a.



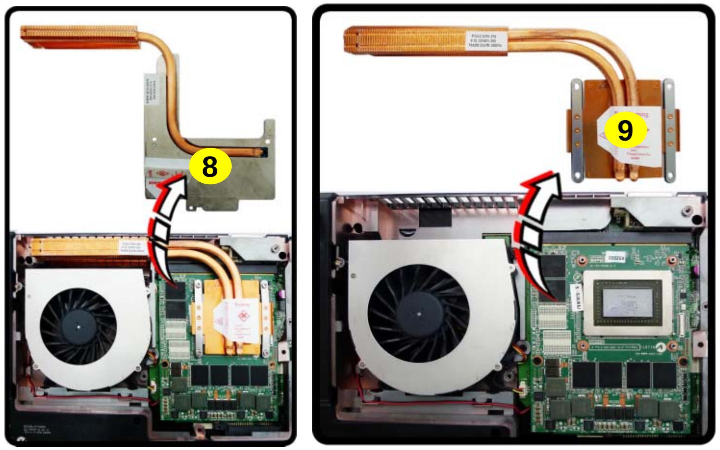
c.



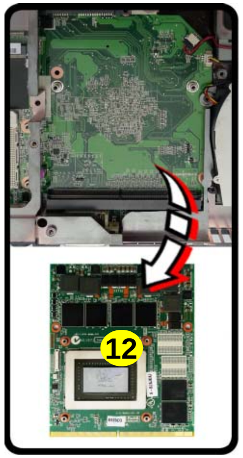
Note:

Please use a flat head screwdriver to remove screws 10 & 11.

b.



d.



Caution

The heat sink, and video card area in general, contains parts which are subject to high temperatures. Allow the area time to cool before removing these parts.

8 & 9.Heat Sink Units
12. Video Card

- 9 Screws

Heat Sink Screw Removal and Insertion

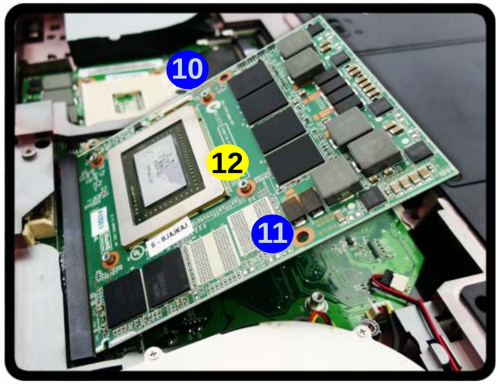
Remove the screws from the heat sink in the order indicated here: 7-**6-5-4-3-2-1**.

When tightening the screws, make sure that they are tightened in the order: **1-2-3-4-5-6-7**.

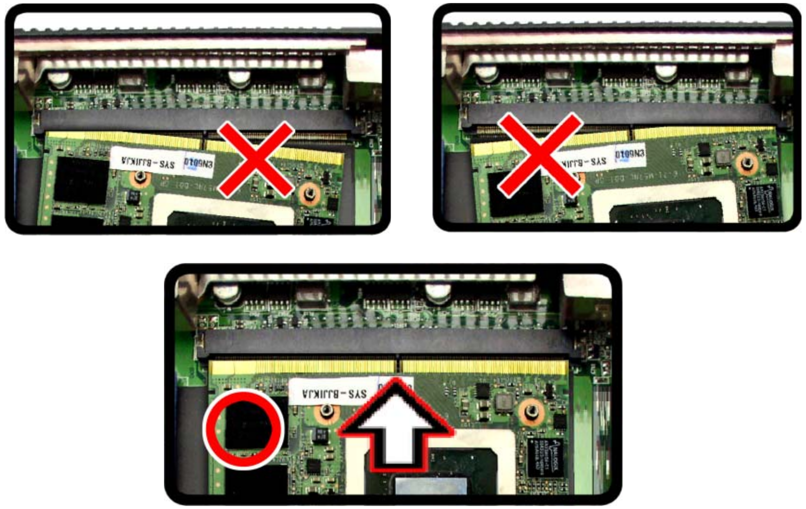
Installing a New Video Card

1. Prepare to fit the video card **12** into the slot by holding it at about a 30° angle (***Figure 17e***).
2. The card needs to be fully into the slot, and the video card and socket have a guide-key and pin which align to allow the card to fit securely (***Figure 17f***).
3. Fit the connectors firmly into the socket, straight and evenly.

e.



f.



4. DO NOT attempt to push one end of the card in ahead of the other.
5. The card's pin alignment will allow it to only fit one way. **Make sure the module is seated as far into the socket as it will go** (none of the gold colored contact should be showing). DO NOT FORCE the card; it should fit without much pressure.
6. Secure the card with screws **10** & **11** (***Figure 17 on page 2 - 21***).
7. Place the heat sink back on the card, and secure the screws in the order indicated in ***Figure 17 on page 2 - 21***.
8. Attach the video card fan and secure with the screws as indicated in ***Figure 16 on page 2 - 20***.
9. Reinsert the component bay cover, and secure with the screws as indicated in ***Figure 10 on page 2 - 14***.

Figure 17
Installing a New Video Card

e. Insert the video card at a 30 degree angle.
f. Fit the connectors straight and even.

Caution

The heat sink, and video card area in general, contains parts which are subject to high temperatures. Allow the area time to cool before removing these parts.

12. Video Card

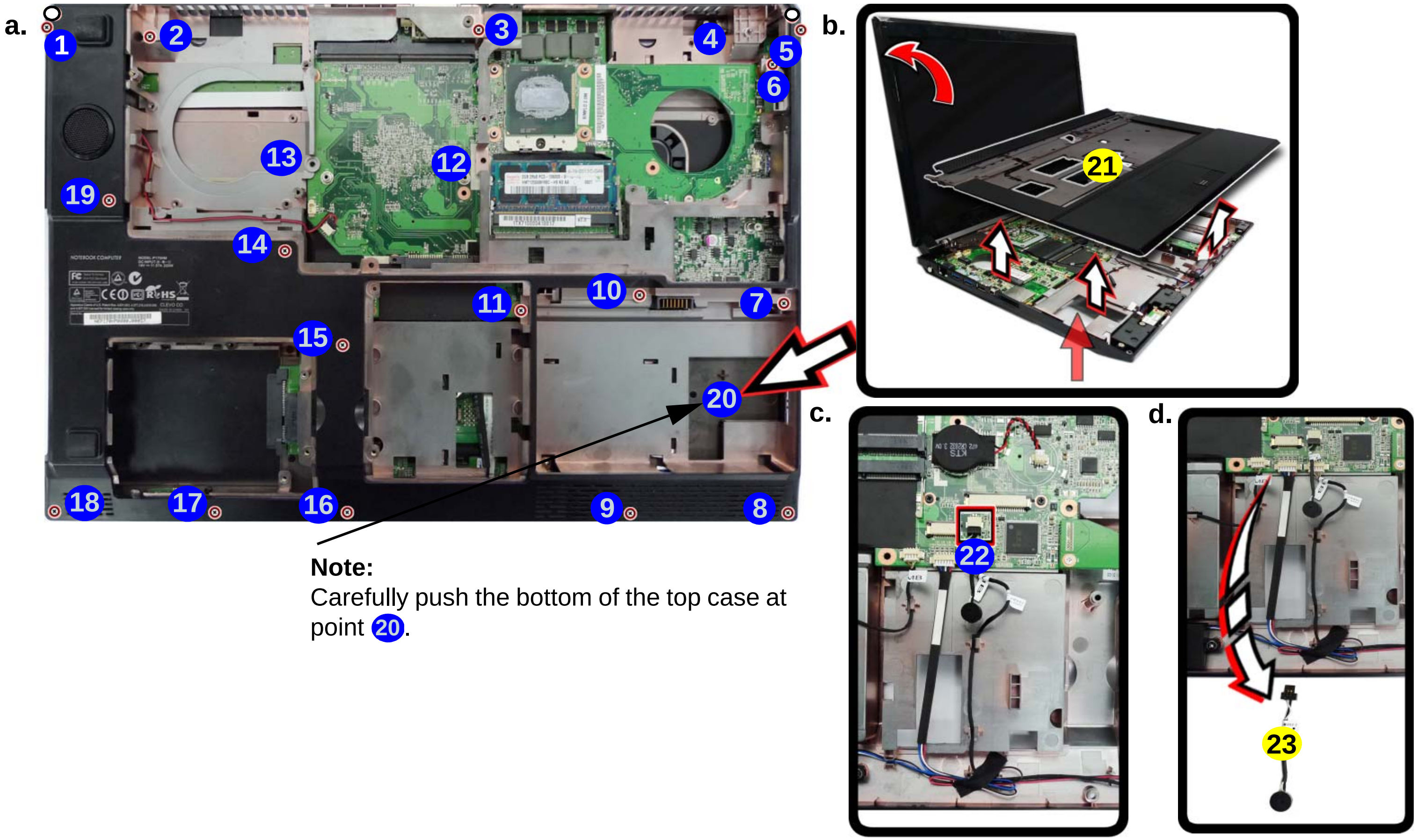
- 2 Screws

Figure 18
Microphone Removal

a. Remove the screws.
b. Lift the top case up, keeping it level (do not tilt it).
c. Disconnect the microphone cable.
d. Remove the microphone.

Removing the Microphone

1. Turn **off** the computer, and remove the battery (***page 2 - 5***), component bay cover (***page 2 - 10***), processor (***page 2 - 17***), hard disk (***page 2 - 6***) (***page 2 - 10***), optical device (***page 2 - 9***), and video card (***page 2 - 20***).
2. Remove screws 1 - 19 and carefully push the bottom of the top case at point 20 (***Figure 18a***)
3. Lift the top case 21 up, keeping it level (do not tilt it) ***Figure 18b***.
4. Disconnect the microphone cable 22 (***Figure 18c***).
5. Remove the microphone 23 (***Figure 18d***).



Note:
Carefully push the bottom of the top case at point 20.

21. Top Case
23. Microphone

- 19 Screws

Appendix A: Part Lists

This appendix breaks down the ***P170EM*** series notebook's construction into a series of illustrations. The component part numbers are indicated in the tables opposite the drawings.

Note: This section indicates the *manufacturer's* part numbers. Your organization may use a different system, so be sure to cross-check any relevant documentation.

Note: Some assemblies may have parts in common (especially screws). However, the part lists DO NOT indicate the total number of duplicated parts used.

Note: Be sure to check any update notices. The parts shown in these illustrations are appropriate for the system at the time of publication. Over the product life, some parts may be improved or re-configured, resulting in *new* part numbers.

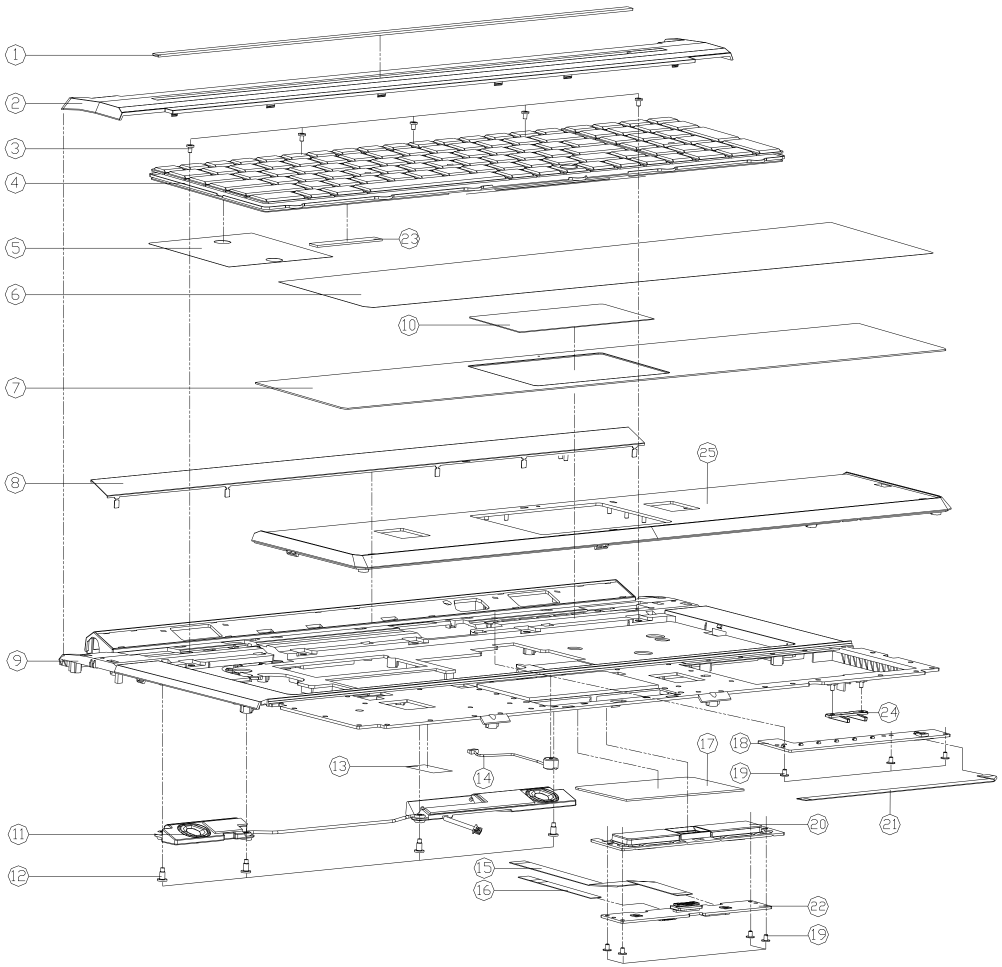
Part List Illustration Location

The following table indicates where to find the appropriate part list illustration.

Table A- 1
Part List Illustration Location

Parts	
Top with Fingerprint	*page A - 3*
Top without Fingerprint	*page A - 4*
Bottom	*page A - 5*
LCD	*page A - 6*
HDD	*page A - 7*
COMBO	*page A - 8*
DVD-Dual Drive	*page A - 9*

Top with Fingerprint



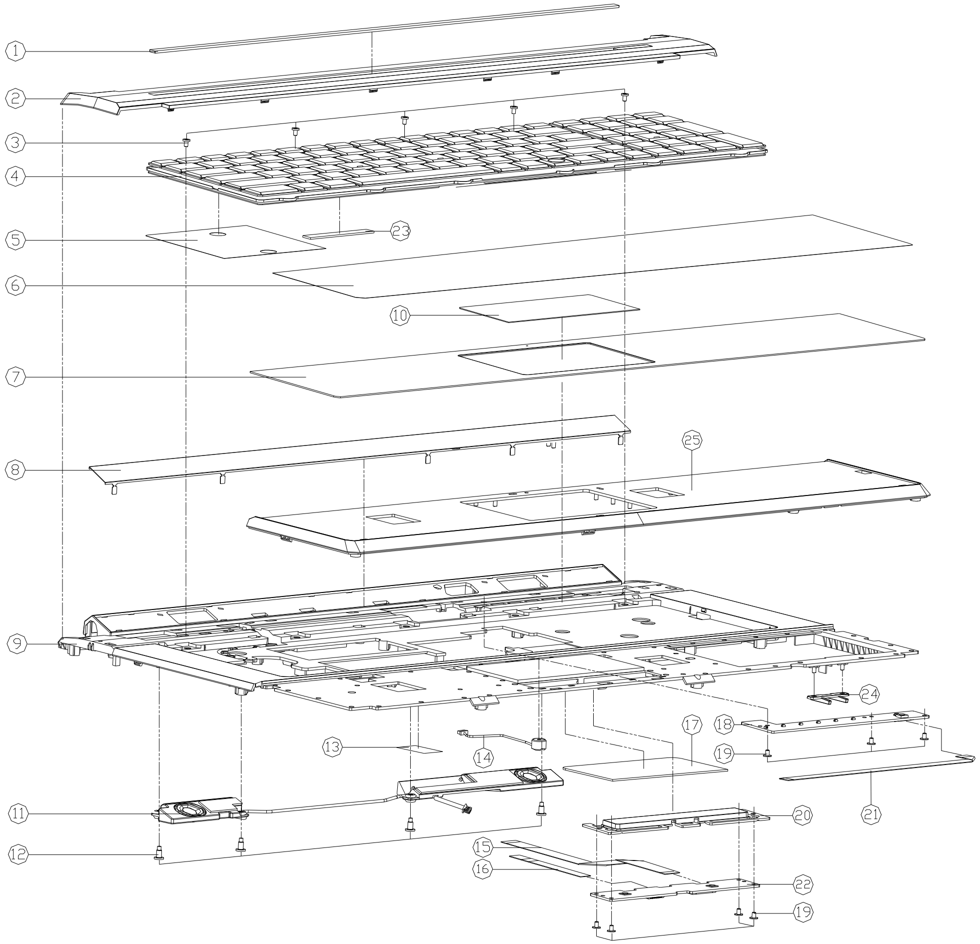
ITEM	PART NAME	PART NO	REMARK
1	TOP COSMETIC PLATE PMMA P170HM	6-42-P1702-022	
2	CENTER COVER MODULE (KAPOK PRINT ONKYO ICON) P170EM	6-42-P17E2-502-N	
3	SCREW M2*3L KI NI ICT NY (DD=ø4.5,DT=0.4)	6-35-B1120-3RE	
4	K/B USA V132150AK1 P270WM BLACK BACKLIGHT WITH GAMING	6-80-P2700-010-3	
5	KEYBOARD MYLAR (75*70*0.1) P170EM	6-40-P17E2-010	
6	TOP CASE PROTECT MYLAR(PET+3M8915) P170HM	6-40-P1702-020	
7	AL PLATE FOR PALM REST(PVT2) P170HM	6-33-P1702-021	
8	TOP SPEAKER MESH SUS304 P170EM	6-33-P17E2-010	
9	TOP CASE MODULE [MP1] P170EM	6-39-P17E2-012	
10	TP MYLAR P170HM	6-40-P1702-030	
11	SPK+CABLE FRONT R?L 51*20 T5.2 2.0W 4? EE09184A P150EM	6-23-5P15E-0S1	
12	SCREW M2*6.2L NI ICT NY FOR SPEAKER	6-35-Z1120-6R2	
13	AL FOIL(40*15*0.25T) P170HM	6-47-P1702-010	
14	MIC 6MM*3.5(EM6035-FOL-U) 2V~10V 2.2K W/CABLE(GRAY) L=45MM R130T	6-23-ER130-010-1	
15	FFC CABLE FOR CLICK BD TO M/B 10PIN PITCH=1.0 L=152MM (HB) P170HM	6-43-P1700-022	
16	FFC CABLE FOR TOUCH PAD 6PIN C4500	6-43-C4502-010	
17	TOUCH PAD SYNAPTICS TM-01146-003 MULTI-GES	6-49-C4802-010	
18	LED BOARD V3.0 P170EM	6-77-P17E4-D03	
19	SCREW M2*4L KI NI ICT NY (DD=ø4.0,DT=0.5)	6-35-B1120-4RA	
20	CLICK MODULE W-FP [MP1] P170EM	6-42-P17E2-202	
21	FFC CABLE FOR POWER BD TO M/B 15PIN PITCH=0.5 L=147MM (HB) P170HM	6-43-P1700-012	
22	CLICK BOARD V3.0+FINGERPRINT BOARD V2.0 ASS'Y P170EM	6-77-P17EA-N03	
23	SPONGE CR 45*6*0.5T P170EM	6-47-0019A-007	
24	FRONT LED LENS ABS(PA758) P170HM	6-42-P1702-030	
25	PALM REST COVER (KAPOK UV)[MP1] P170EM	6-42-P17E2-042-1	

Figure A - 1
Top with Fingerprint

A.Part Lists

Top without Fingerprint

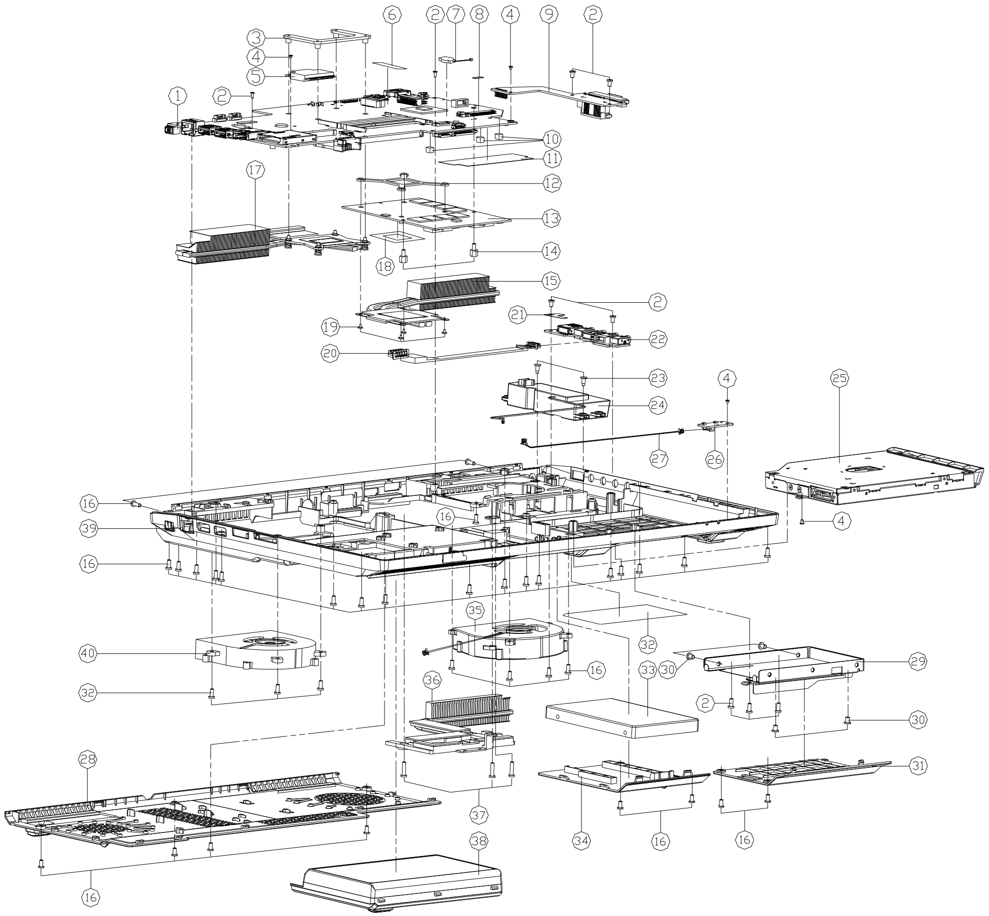
Figure A - 2
Top without Fingerprint



ITEM	PART NAME	PART NO	REMARK
1	TOP COSMETIC PLATE PMMA P170HM	6-42-P1702-022	
2	CENTER COVER MODULE (KAPOK PRINT ONKYO ICON) P170EM	6-42-P17E2-502-N	
3	SCREW M2*3L KI NI ICT NY (DD=ø4.5,DT=0.4)	6-35-B1120-3RE	
4	K/B USA V132150AK1 P270WM BLACK BACKLIGHT WITH GAMING	6-80-P2700-010-3	
5	KEYBOARD MYLAR (75*70*0.1) P170EM	6-40-P17E2-010	
6	TOP CASE PROTECT MYLAR(PET+3M8915) P170HM	6-40-P1702-020	
7	AL PLATE FOR PALM REST(PVT2) P170HM	6-33-P1702-021	
8	TOP SPEAKER MESH SUS304 P170EM	6-33-P17E2-010	
9	TOP CASE MODULE [MP1] P170EM	6-39-P17E2-012	
10	TP MYLAR P170HM	6-40-P1702-030	
11	SPK+CABLE FRONT R?L 51*20 T5.2 2.0W 4? EE09184A P150EM	6-23-5P15E-0S1	
12	SCREW M2*6.2L NI ICT NY FOR SPEAKER	6-35-Z1120-6R2	
13	AL FOIL(40*15*0.25T) P170HM	6-47-P1702-010	
14	MIC 6MM*3.5(EM6035-FOL-U) 2V~10V 2.2K W/CABLE(GRAY) L=45MM R130T	6-23-ER130-010-1	
15	FFC CABLE FOR CLICK BD TO M/B 10PIN PITCH=1.0 L=152MM (HB) P170HM	6-43-P1700-022	
16	FFC CABLE FOR TOUCH PAD 6PIN C4500	6-43-C4502-010	
17	TOUCH PAD SYNAPTICS TM-01146-003 MULTI-GES	6-49-C4802-010	
18	LED BOARD V3.0 P170EM	6-77-P17E4-D03	
19	SCREW M2*4L KI NI ICT NY (DD=ø4.0,DT=0.5)	6-35-B1120-4RA	
20	CLICK BUTTON WO-FP MODULE P170HM	6-42-P1702-102	
21	FFC CABLE FOR POWER BD TO M/B 15PIN PITCH=0.5 L=147MM (HB) P170HM	6-43-P1700-012	
22	CLICK BOARD V4.0 (W/O FP) P170EM	6-77-P17E2-D04-1	
23	SPONGE CR 45*6*0.5T P170EM	6-47-0019A-007	
24	FRONT LED LENS ABS(PA758) P170HM	6-42-P1702-030	
25	PALM REST COVER (KAPOK UV)[MP1] P170EM	6-42-P17E2-042-1	

A.Part Lists

Bottom



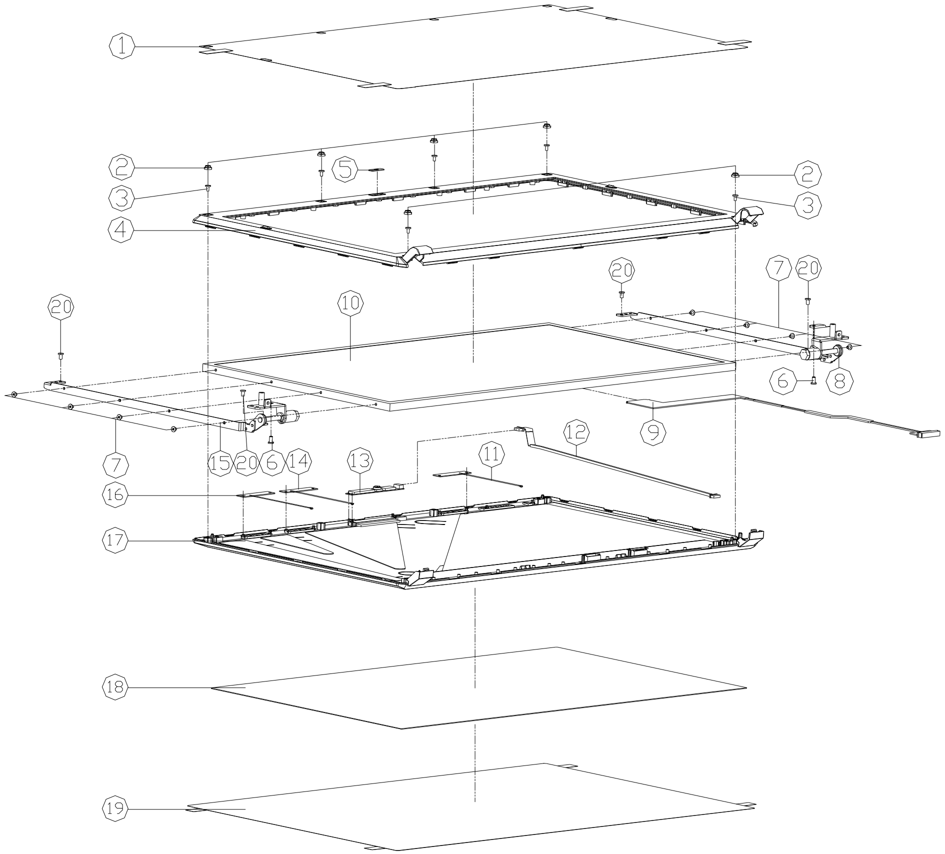
ITEM	PART NAME	PART NO	REMARK
1	MAIN BOARD V5.0A P170EM	6-77-P17E0-D05A	
2	SCREW M2.5*4L K1 BK/O ICT NY	6-35-B4125-4RA	
3	CPU SUPPORT BRACKET SECC T=1.5 P150HM	6-33-X510S-011	
4	SCREW M2*3L KI NI ICT NY (DD=ø4.5,DT=0.4)	6-35-B1120-3RE	
5	WLAN 802.11A+G+N INTEL PUMA PEAK (WIFI LINK 6300) 633AN_HMWG 3X3 MINI-CARD PCI-E (半卡) MOW	6-88-M77C2-4220	(OPTION)
5	WLAN+BT COMBO CASTLENET RTL8188CEBT-G1951	6-88-C555F-5300	(OPTION)
5	WLAN+BT COMBO AZUREWAVE AW-NB057H 802.11BG	6-88-C555F-7001	(OPTION)
5	WLAN+BT COMBO INTEL WIRELESS-N 2230 (JACKSON PEAK 1) 2230BNHMWG 2X2 BGN+BT 4.0 LE HALF MINI-CARD PCI-E P170EM	6-88-P17EF-4200	(OPTION)
5	WLAN+BT COMBO INTEL ADVANCED-N 6235 (JACKSON PEAK 2) 6235ANHMWG 2X2 ABGN+BT 4.0 LE HALF MINI-CARD PCI-E	6-88-W25SF-4200	(OPTION)
6	TAPE MYLAR (C),MYLAR M550J	6-40-M55J2-030	
7	BAT. 20MM 3V 220MAH W/CABLE 55MM BCR2032W5	6-23-22015-TC0	
8	M/B KEYBOARD MYLAR PET M810L	6-40-M810S-011	
9	HDD/ODD BOARD V2.0 P170EM	6-77-P17EJ-D02	
10	VGA SUPPORT RUBBER B SILICONE P150HM	6-47-X510S-010	
11	MYLAR (76.5*28.5*0.2T) FOR MB SATA HDD CONNECTOR P150HM	6-40-X510S-010	
12	VGA SUPPORTER SUS430 X7200	6-33-X720S-040	
13	VGA BOARD NVIDIA N13E-GS1 (CHIL8214 Ver.07) GDDR5(2G/32M*32) MXM-III V1.0--SMT/TOP P150EM	6-77-X510L-101-2	
13	VGA BOARD NVIDIA N13E-GS1 (CHIL8214 Ver.07) GDDR5(2G/32M*32) MXM-III V1.0--SMT/BOT P150EM	6-77-X510L-201-2	
13	VGA BOARD NVIDIA N13E-GS1-LP (CHIL8214 Ver.07) GDDR5(1.5G/32M*32) MXM-III V1.0--SMT/TOP P150EM	6-77-X510L-101-3	
13	VGA BOARD NVIDIA N13E-GS1-LP (CHIL8214 Ver.07) GDDR5(1.5G/32M*32) MXM-III V1.0--SMT/BOT P150EM	6-77-X510L-201-3	
14	SCREW M2.5*4.8L(T=8 D=5)NI ICT NY FOR VGA CARD	6-35-Z1125-4R8-1	
15	GPU(GTX) HEATSINK MODULE CHANGE P150HM	6-31-X510N-303	FOR (N12E-GTX)
16	SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
17	CPU HEATSINK MODULE(CU FIN) FOR P170HM	6-31-P170N-101	
18	MYLAR VGA CHIP NV P270WM	6-40-P270S-030	
19	SCREW M1.6*3.5L K(T=1.2 D=4.5) BZ ICT NY	6-35-82116-3R5	
20	WIRE CABLE FOR AUDIO BOARD TO MB 20P P170HM	6-43-P1700-032-1	
21	AUDIO MYLAR FR83 P150HM	6-40-X510S-030	
22	AUDIO BOARD V2.0 P150EM	6-77-P15E8-D02	
23	SCREW M2*6.2L NI ICT NY FOR SPEAKER	6-35-Z1120-6R2	
24	SPK+CABLE SUBWOOFER 26.6*11 2.5W 4? PM2502A P150EM	6-23-5P15E-0W1	
25	W/O ODD ASS'Y P170HM	6-79-P170HM0Z-000	
25	SATA DVD SUPER MULTI ASS'Y (OPTION)	6-79-P170EM0Q-010	
25	SATA BLU-RAY COMBO ASS'Y (OPTION)	6-79-P170EM0W-010	
25	SATA BLU-RAY WRITER ASS'Y (OPTION)	6-79-P170HM0W-011	
26	LED BOARD V2.0 P150EM	6-77-P15E4-D02	
27	WIRE CABLE FOR LED BOARD TO MB 5P P170HM	6-43-P1700-041	
28	CPU COVER MODULE (MODIFY RIB) P170HM	6-42-P1708-106	
29	SECOND HDD BRACKET(SECC 0.8T+ SPTE 0.3T+MYLAR 0.3T) P170EM	6-33-P170J-013	
30	(非耐落)SCREW M3*4L KI NI ICT	6-35-B1130-4RB	
31	SECOND HDD COVER SABIC C7230P-701DE P170HM	6-42-P170J-021	
32	PRODUCT LABEL FOR P170EM(CHANGE ADHESIVE)	6-45-P170EM03-012	
33	W/ HDD ASS'Y P170HM	6-79-P170HM0J-020	
33	W/O HDD ASS'Y P170HM	6-79-P170HM0J-010	
33	W/O 2ND HDD ASS'Y P170HM	6-79-P170HM0J-030	
33	W/ 2ND HDD ASS'Y P170HM	6-79-P170HM0J-040	
34	MAIN HDD COVER SABIC C7230P-701DE (MP) (MODIFY RIB) P170HM	6-42-P170J-013	
35	FAN MODULE 85*18.5MM 5V 0.5A 3200RPM BS6005MS-U94 A-POWER X7200	6-31-X720S-101	
36	VRAM(N13E-GS1) HEATSINK MODULE P150EM	6-31-P15EN-300	
37	SCREW M2*5L KI(T=0.8 D=4.0) BK/Z ICT NY	6-35-B6120-5R0	
38	BAT.P S LI 14.8V/5.2AH/76.96WH 4S2P CELXPERT/SDI PSE 910500006 X7100	6-87-X710S-4J72	(OPTION)
38	BAT.P S LI 14.8V/5.2AH/76.96WH 4S2P SMP/SDI PSE 980T2026F X7100	6-87-X710S-4272	(OPTION)
39	BOTTOM CASE MODULE [MP1] P170EM	6-39-P17E3-012	
40	FAN+CON. 77*73.5*15MM 5V 0.5A BS6005MS-U0D 3500RPM APOWER P150HM	6-23-AX510-012	

Figure A - 3
Bottom

A.Part Lists

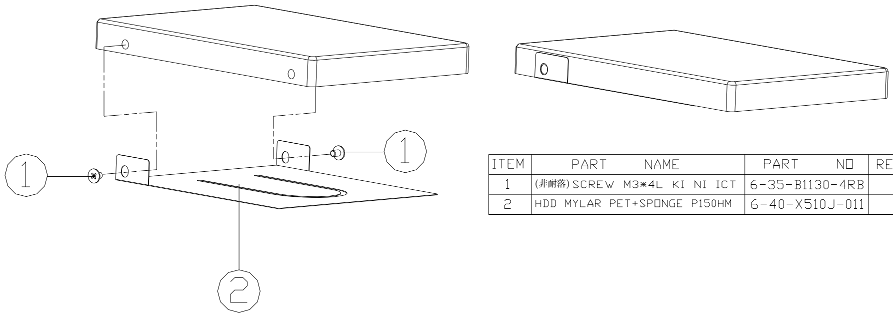
LCD

Figure A - 4
LCD



ITEM	PART NAME	PART NO	REMARK
1	FRONT PROTECTION MYLAR (PET+3M8915) P170HM	6-40-P1701-010	
2	LCD FRONT COVER UP RUBBER P170HM	6-47-P1701-042	
3	SCREW M2*5L KI(T=0.8 D=4.0) BK/Z ICT NY	6-35-B6120-5R0	
4	LCD FRONT COVER MODULE (CHANGE SIDE RUBBER)P170HM	6-39-P1701-013	
5	CCD LENS PMMA P170HM	6-42-P1701-010	
5	W/O CCD LENS PMMA P170EM	6-42-P17E1-010	
6	SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
7	SCREW M2*3L KI NI ICT NY (DD=ø4.5,DT=0.4)	6-35-B1120-3RE	
8	LCD HINGE R SECC [PVT] P170EM	6-33-P17E1-0R1	
9	WIRE CABLE FOR LCD TO M/B(HL/I-PEX CON:20454-040T) P170HM	6-43-P1701-012-3H	
10	LCD 17.3" FHD CHIMEI N173HGE-L11 (LED) 6.0 MM	6-50-NB260-D01	
10	LCD 17.3" FHD CHIMEI N173HGE-L21 (GLARE TYPE) (LED) 6.0 MM	6-50-NB260-D00	
10	LCD 17.3" FHD LG LP173WF1-TLB3 (LED) (40/60HZ) 6.0MM	6-50-NB260-L05	
11	GT WM2 PCB H=0.6MM 2.4G/3.5GHZ/5G L=605MM P170HM	6-23-7P170-021	
12	WIRE CABLE FOR CCD 5P P170HM (HL)	6-43-P170T-010	
13	UVC CAMERA BISON FIX BN28UCSS3-310 2M FHD SAMSUNG5B3 P170EM	6-88-P17EC-4900	
14	ANTENNA WIMAX WGT WM3 PCB H=0.6MM 2.4G/3.5GHZ/5G L=510MM P170HM	6-23-7P170-031	
15	LCD HINGE L SECC [PVT] P170EM	6-33-P17E1-0L1	
16	ANTENNA WIMAX WGT WM1 PCB H=0.6MM 2.4G/3.5GHZ/5G L=500MM P170HM	6-23-7P170-011	
17	LCD BACK COVER MODULE (UV) P170HM (KAPOK)	6-39-P1701-023-1	
18	LCD ALUMINUM PLATE P170HM	6-33-P1701-031	
19	BACK PROTECTION MYLAR (8B35+3M8915) P170HM	6-40-P1701-020	
20	SCREW M2.5*4L K1 BK/O ICT NY	6-35-B4125-4RA	

HDD

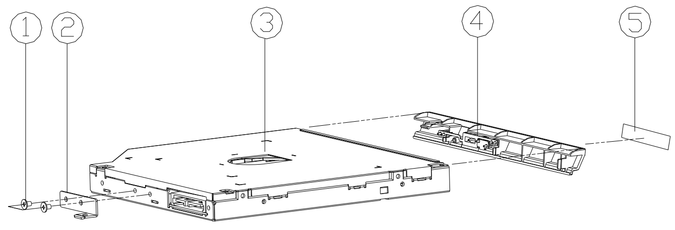


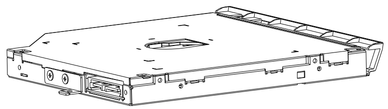
ITEM	PART NAME	PART NO	REMARK
1	(非耐落) SCREW M3*4L KI NI ICT	6-35-B1130-4RB	
2	HDD MYLAR PET+SPONGE P150HM	6-40-X510J-011	

Figure A - 5
HDD

COMBO

Figure A - 6
COMBO



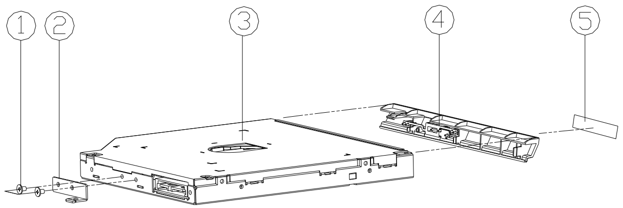


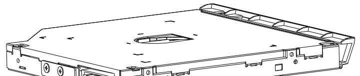
ITEM	PART NAME	PART NO	REMARK
1	SCREW M2*3L KI NI ICT NY (DD=ø4.5,DT=0.4)	6-35-B1120-3RE	
2	ODD BRACKET SECC W860CU	6-33-W860Z-010	
3	SATA BLU-RAY WRITER 5 1/4" 6X 12.7MM UJ240 (AFPK-D) (GREEN LED) H/W: 1.00 F/W: 1000-F/W 1.00 (WIN 7, HF, ZP, AACS) PANASONIC	6-85-B076X-P22	
3	SATA BLU-RAY WRITER 5 1/4" 6X 12.7MM UJ260 (ABAL-D) H/W: 1.00 F/W: 1000 (1.00) (WIN 7, AACS, BDXL) PANASONIC	6-85-B076X-P23	
3	SATA BLU-RAY COMBO 5 1/4" 6X 12.7MM UJ141 (AFAL-D) PANASONIC H/W: 1.00 F/W: 1.00 (WINDOWS 7, ZERO POWER, AACS SUPPORT) PANASONIC	6-85-B076X-P12	
3	SATA BLU-RAY COMBO 5 1/4" 6X 12.7MM CT40N ROM VER. AS00 (WIN 7, BDXL) HLDS	6-85-B076X-513	
4	ODD BEZEL MODULE (TEXTURE) P170HM	6-42-P170Z-101	
5	BLU-RAY ODD BEZEL LABEL (SIZE CHANGE) W860CU	6-45-W860W-011	

A.Part Lists

DVD-Dual Drive

Figure A - 7
DVD-Dual Drive





ITEM	PART NAME	PART NO	REMARK
1	SCREW M2*3L KI NI ICT NY (DD=ø4.5,DT=0.4)	6-35-B1120-3RE	
2	ODD BRACKET SECC W860CU	6-33-W860Z-010	
3	SATA DVD SUPER MULTI 5 1/4" 8X 12.7MM DS-8A8SH (H/W: 01; F/W: KX12) (WIN 7, ZERO POWER) PLDS	6-85-A078X-L06	FOR PLDS
3	SATA DVD SUPER MULTI 5 1/4" 8X 12.7MM SN-208AB/TCAFZ (H/W: A VER.AB F/W TC00) (WINDOWS 7, ZERO POWER) TSST	6-85-A078X-T11	FOR TSST
4	ODD BEZEL MODULE (TEXTURE) P170HM	6-42-P170Z-101	
5	SUPER MULTI ODD BEZEL LABEL (SIZE CHANGE)	6-45-W860Q-011	

A.Part Lists

Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the ***P170EM*** notebook's PCB's. The following table indicates where to find the appropriate schematic diagram.

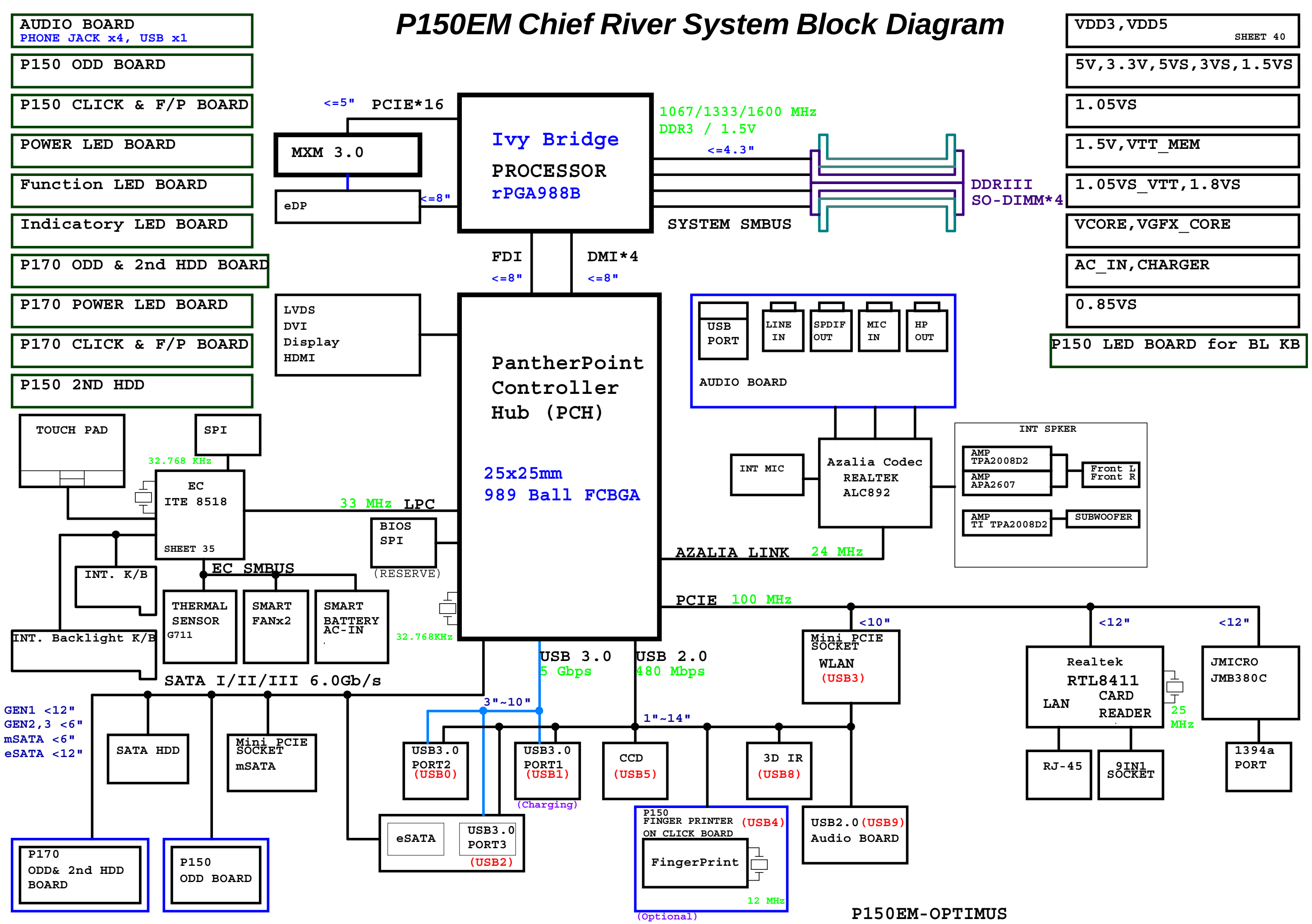
Table B - 1
Schematic Diagrams

Version Note

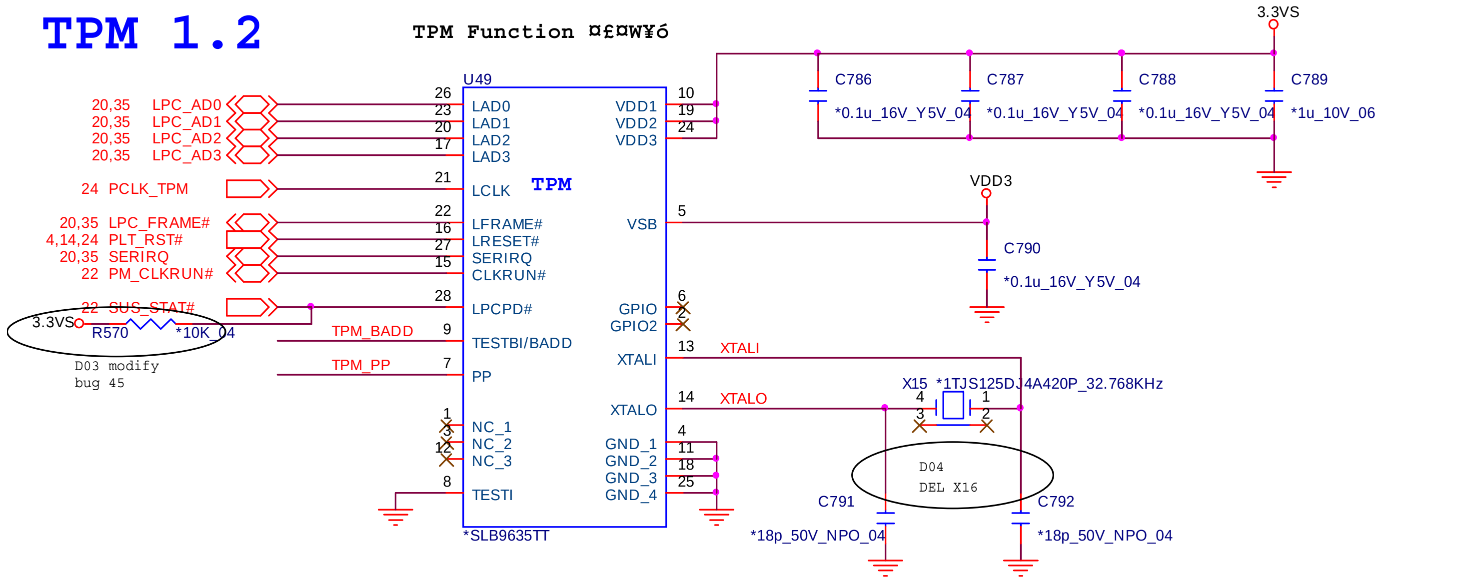
The schematic diagrams in this chapter are based upon version 6-7P-P15EE-002. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

System Block Diagram

Sheet 1 of 61
System Block
Diagram



TPM

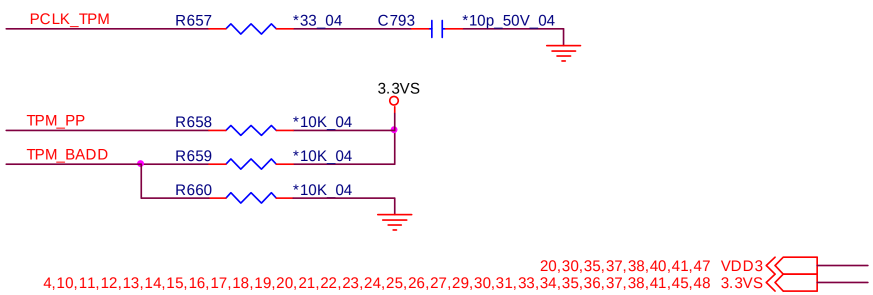


Asserted before entering S3

LPC reset timing:

LPCPD# inactive to LRST# inactive 32~96us

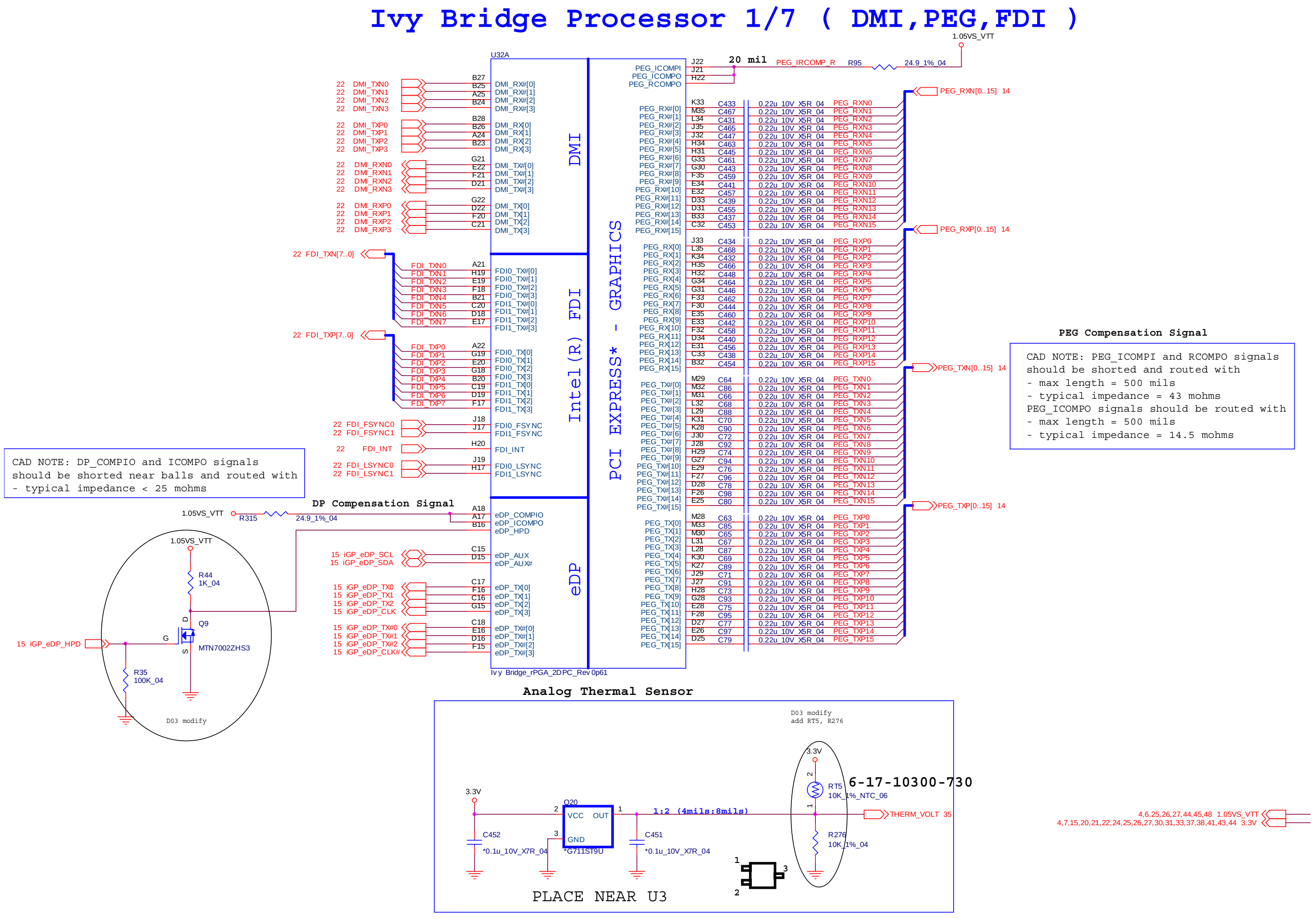
TPM_PP	HI: ACCESS LOW: NORMAL (Internal PD)
TPM_BADD	HI: 4E/ 4F H LOW: 2E/ 2F H



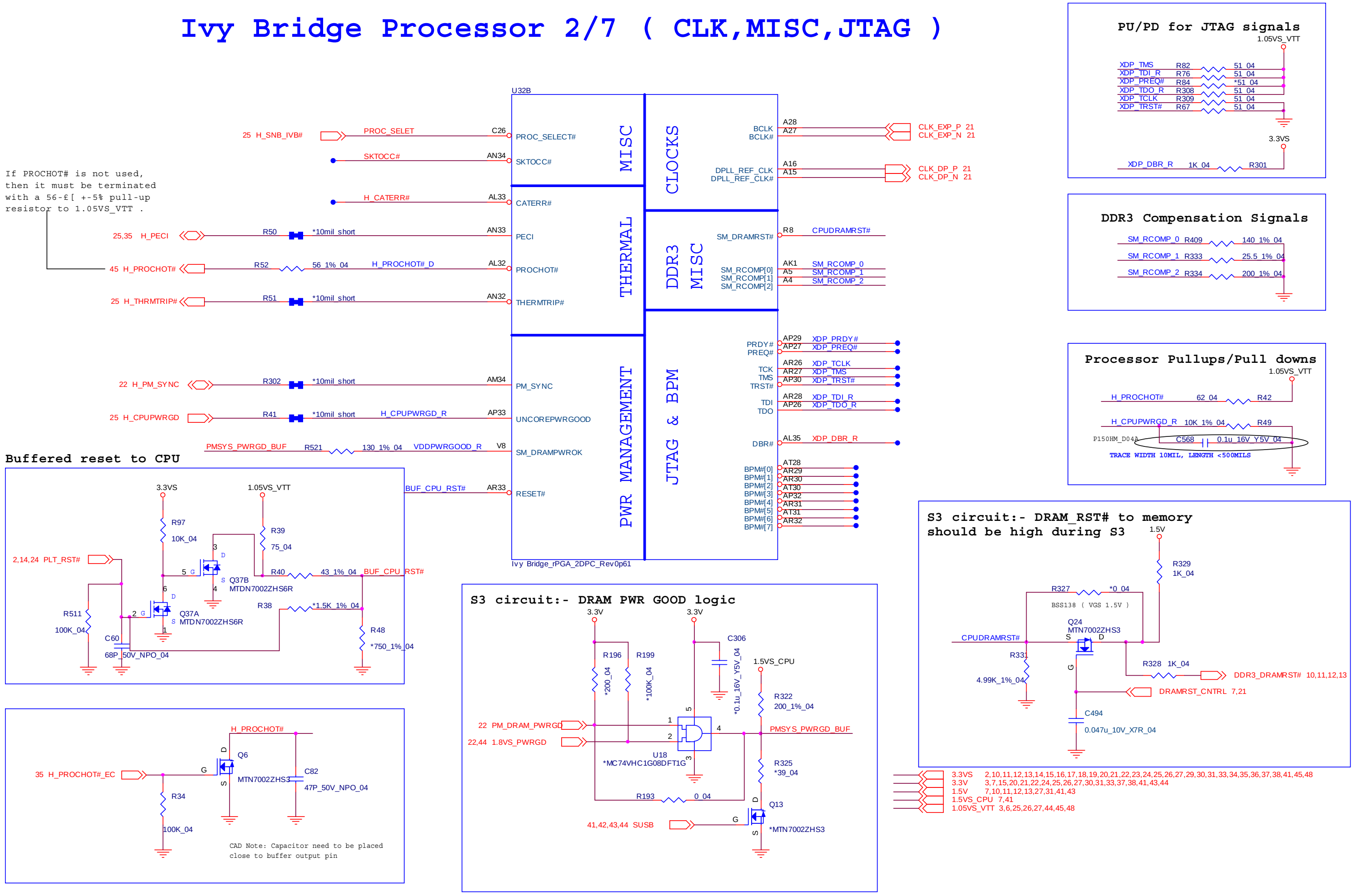
Sheet 2 of 61
TPM

Processor 1/7

Sheet 3 of 61
Processor 1/7



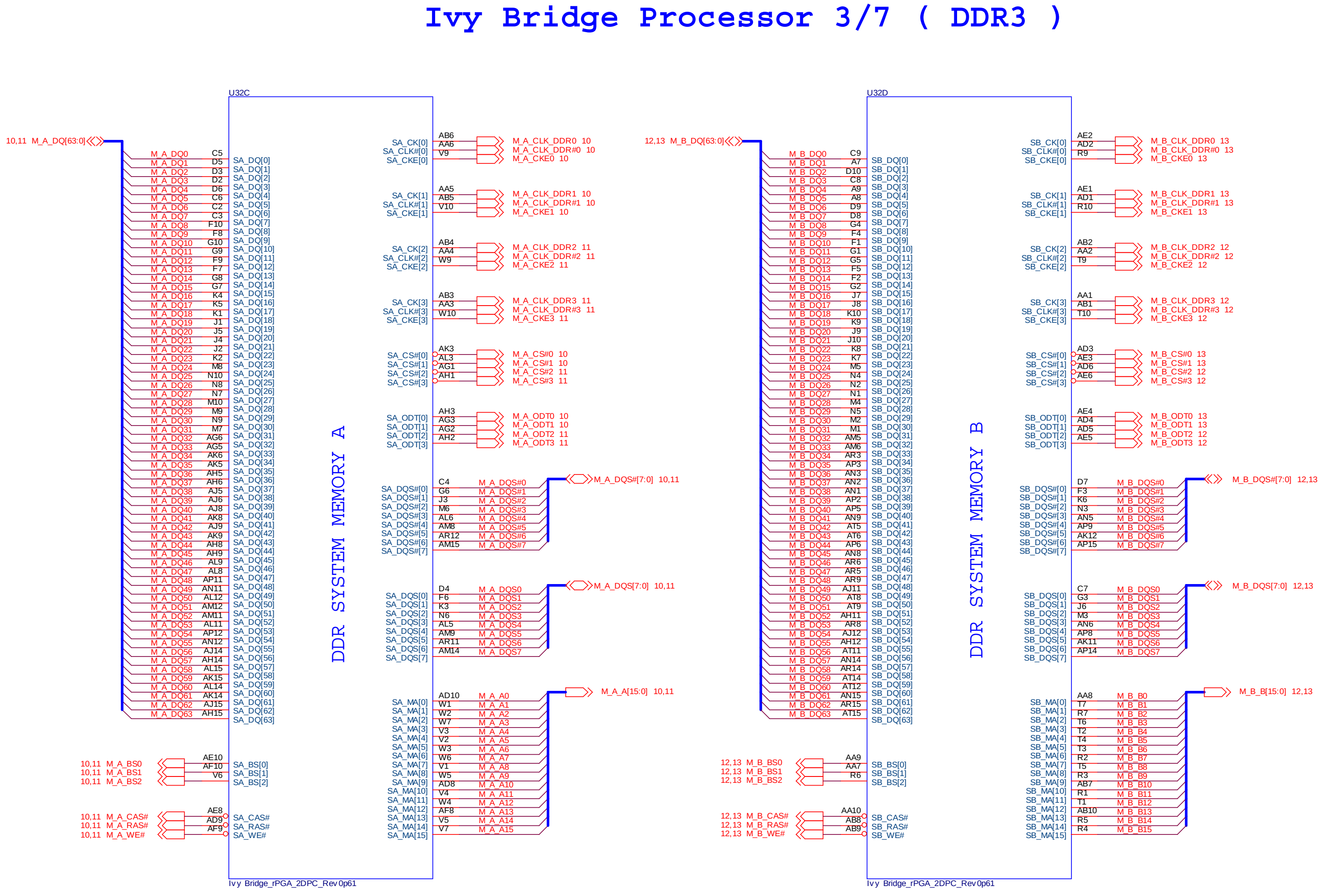
Processor 2/7



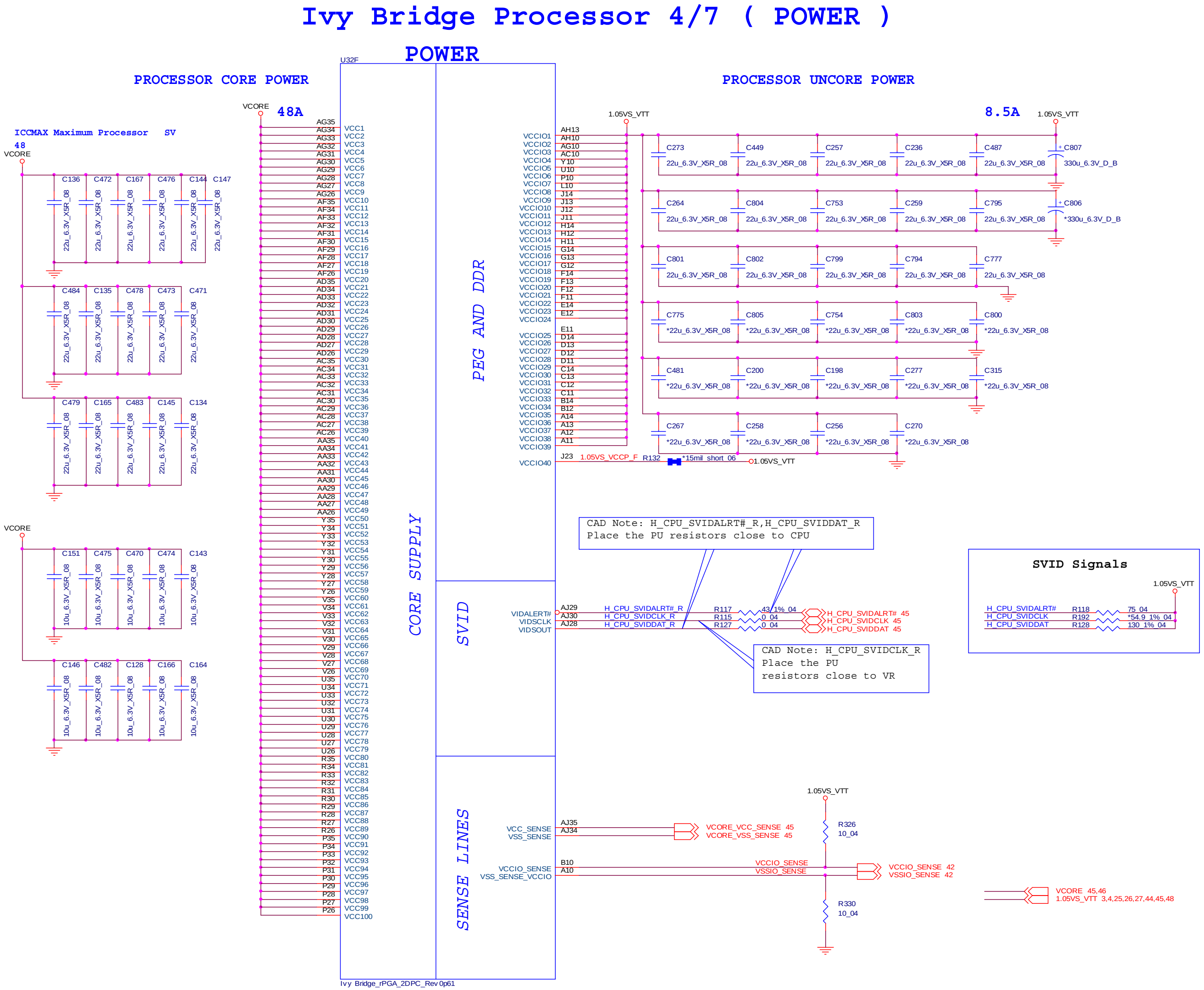
Sheet 4 of 61
Processor 2/7

Processor 3/7

Sheet 5 of 61
Processor 3/7



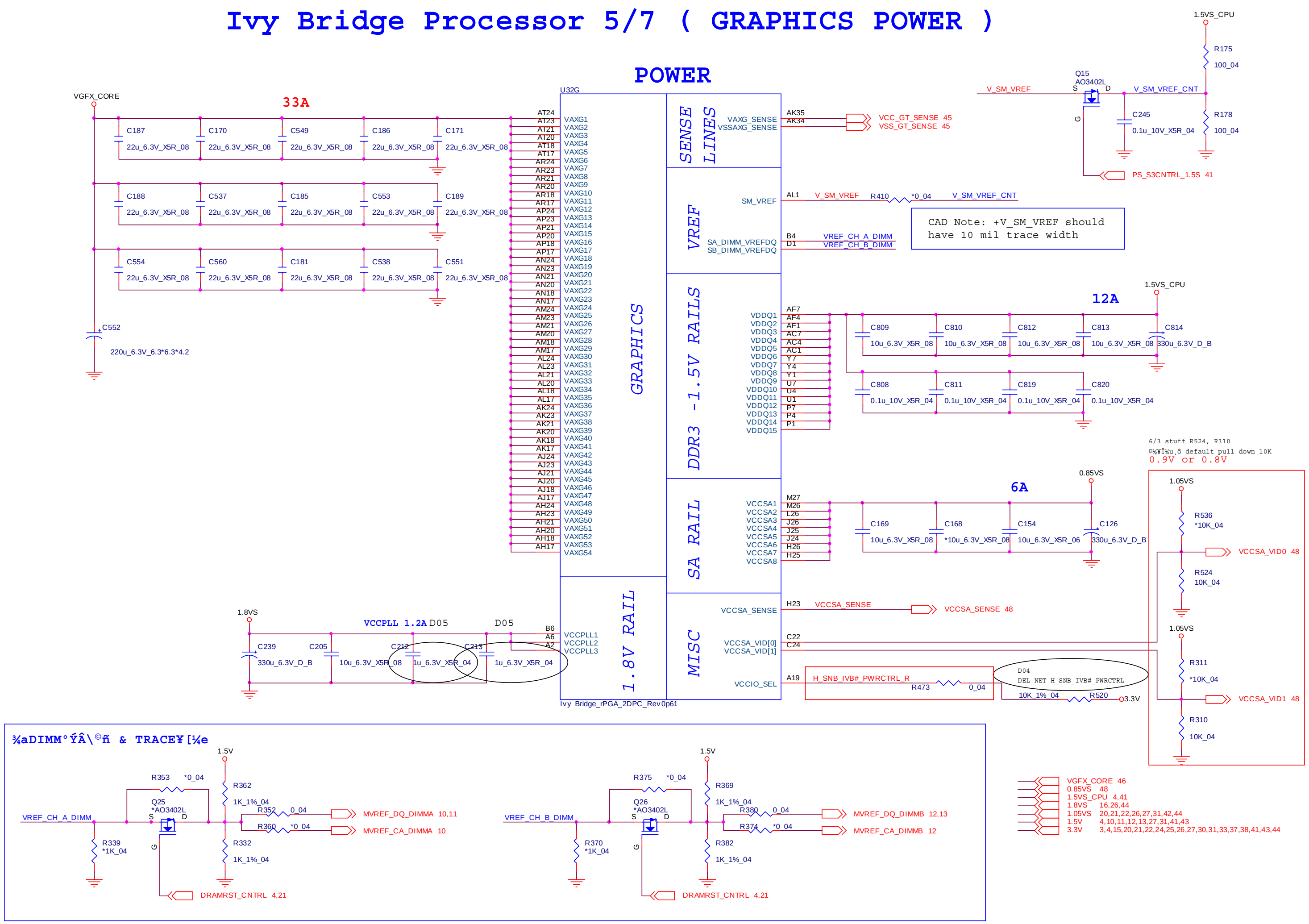
Processor 4/7



Sheet 6 of 61
Processor 4/7

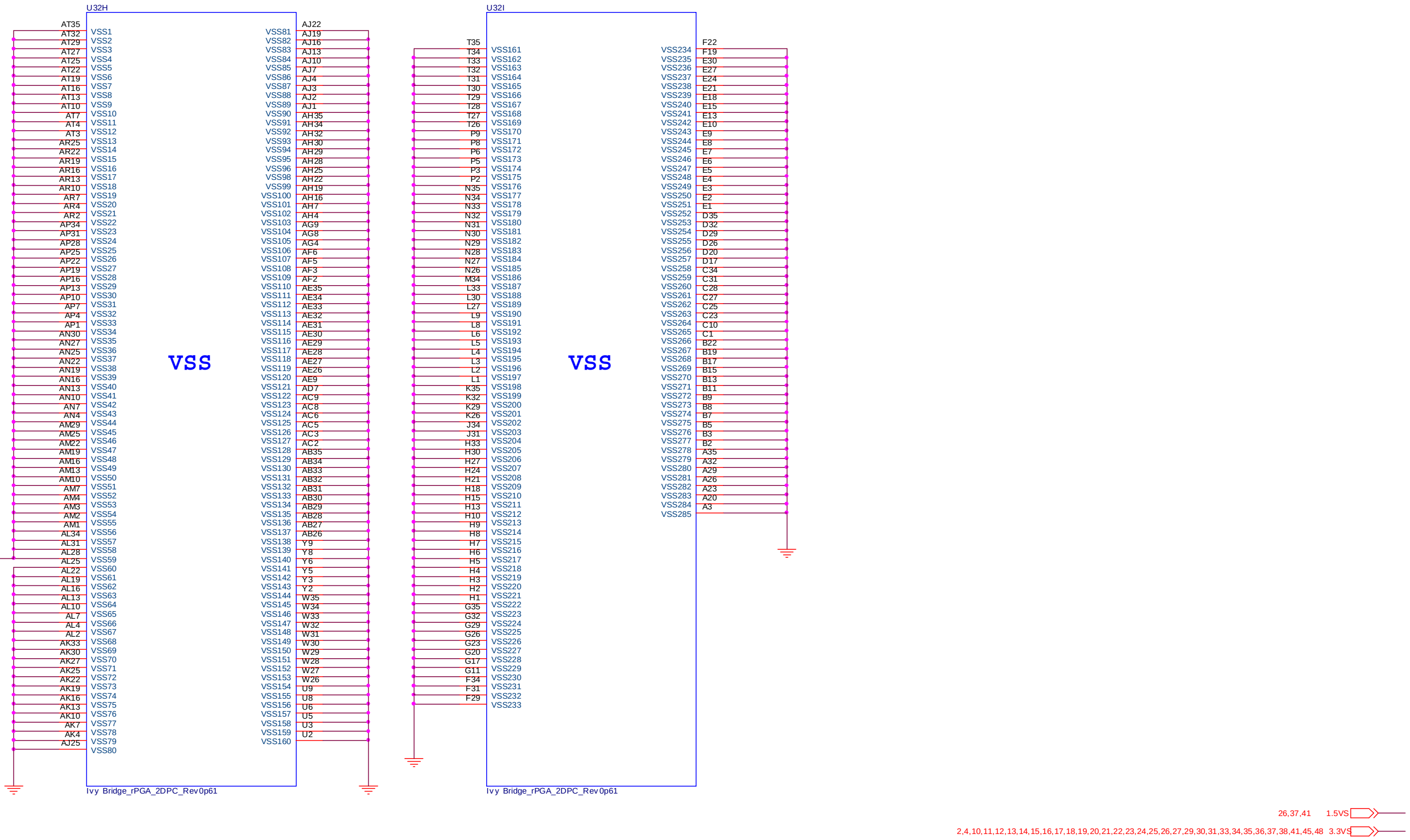
Processor 5/7

Sheet 7 of 61
Processor 5/7



Processor 6/7

Ivy Bridge Processor 6/7 (GND)

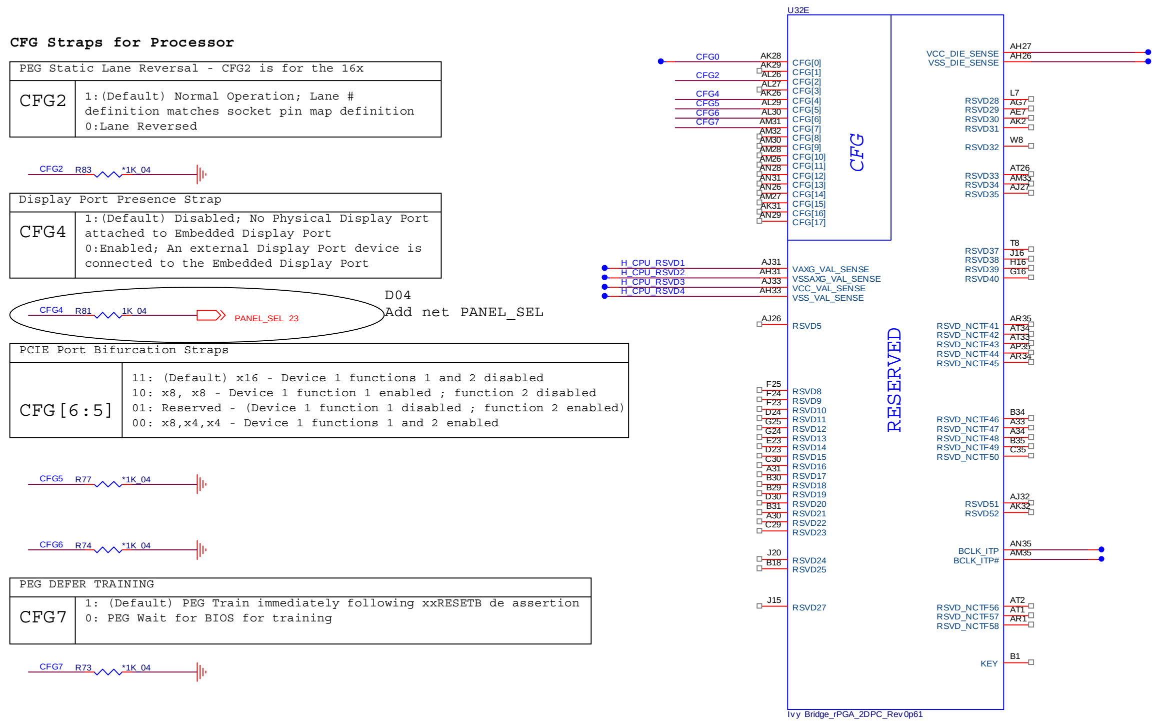


Sheet 8 of 61
Processor 6/7

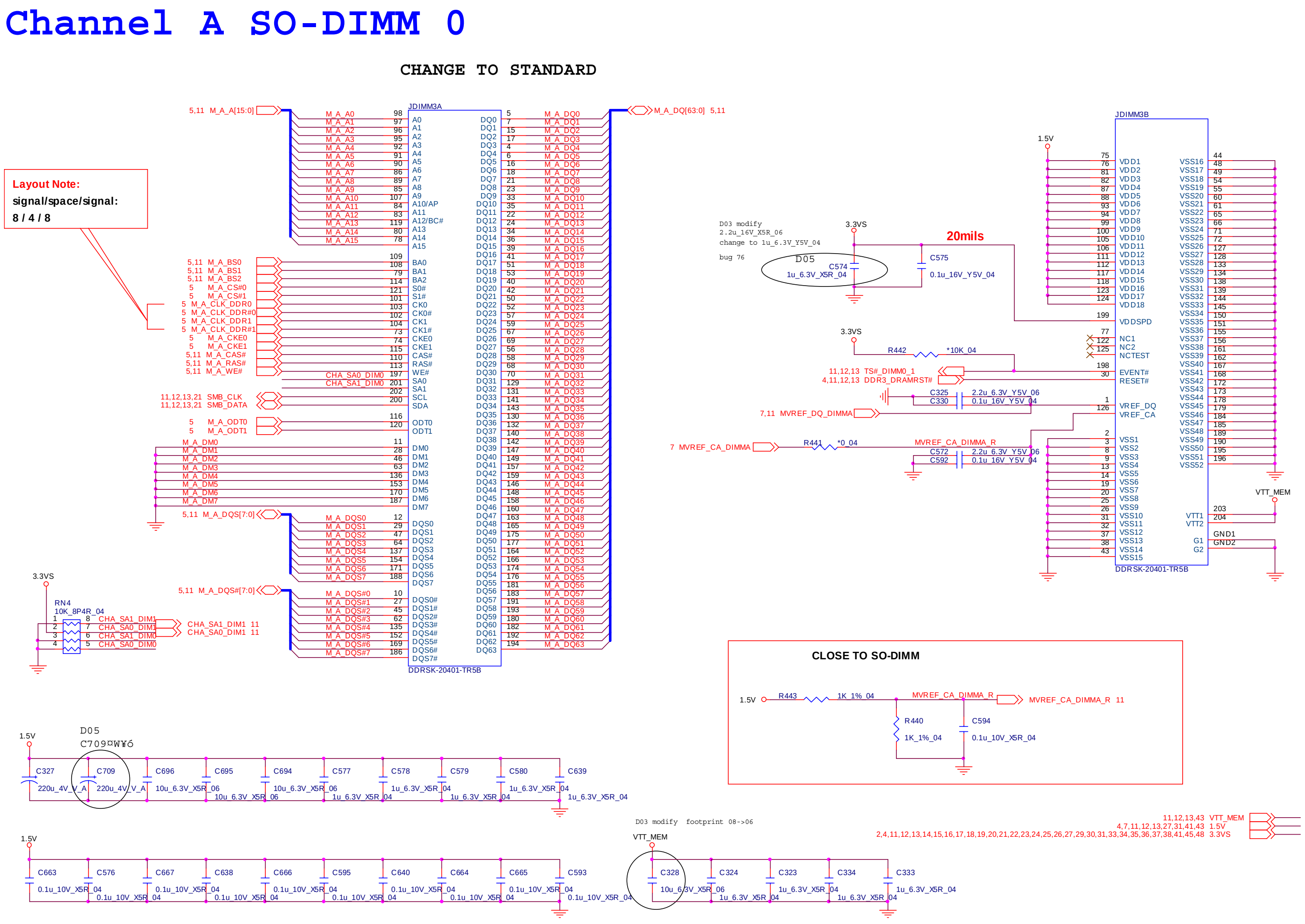
Processor 7/7

Sheet 9 of 61
Processor 7/7

Ivy Bridge Processor 7/7 (RESERVED)



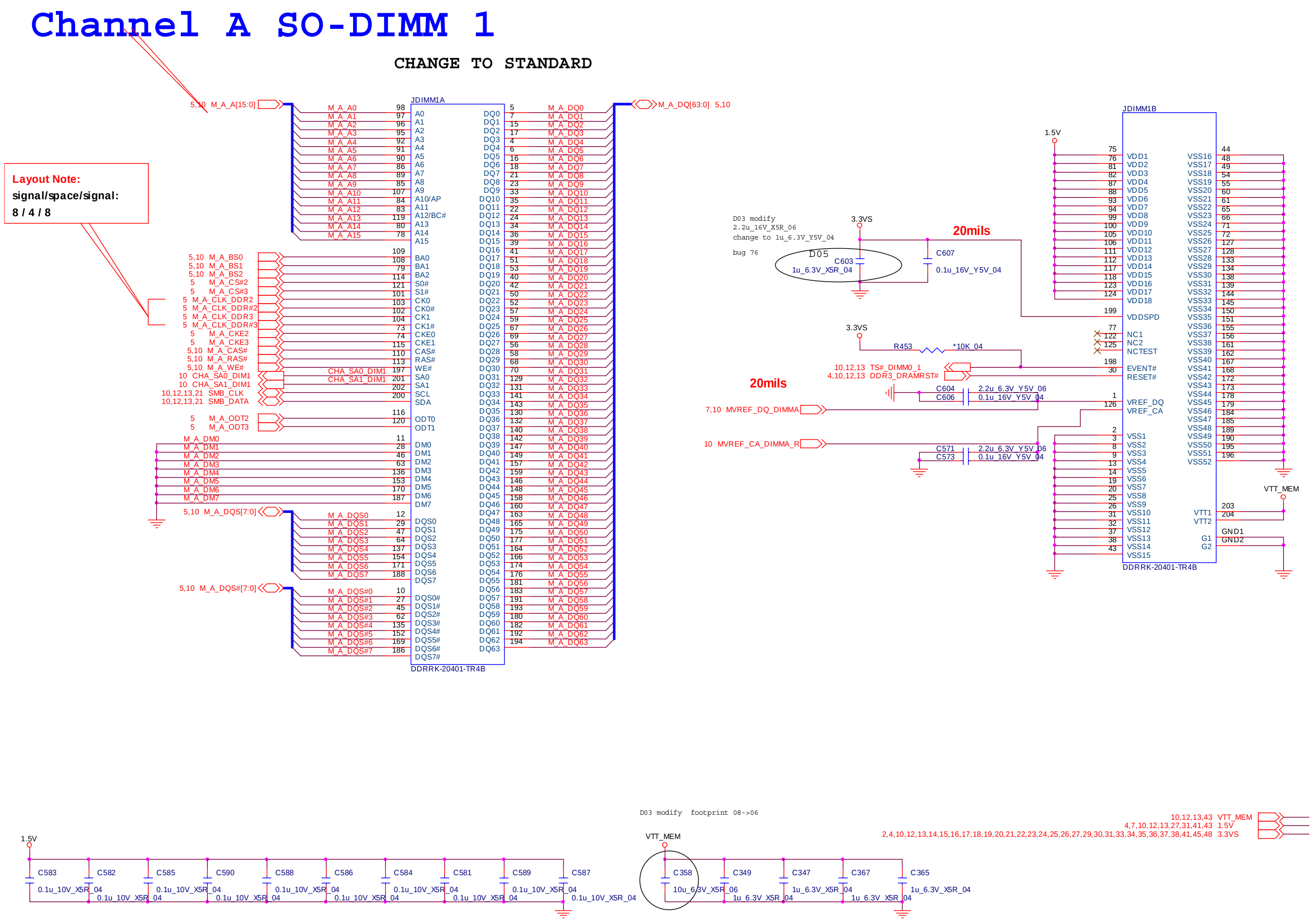
DDRIII CHA SO-DIMM_0



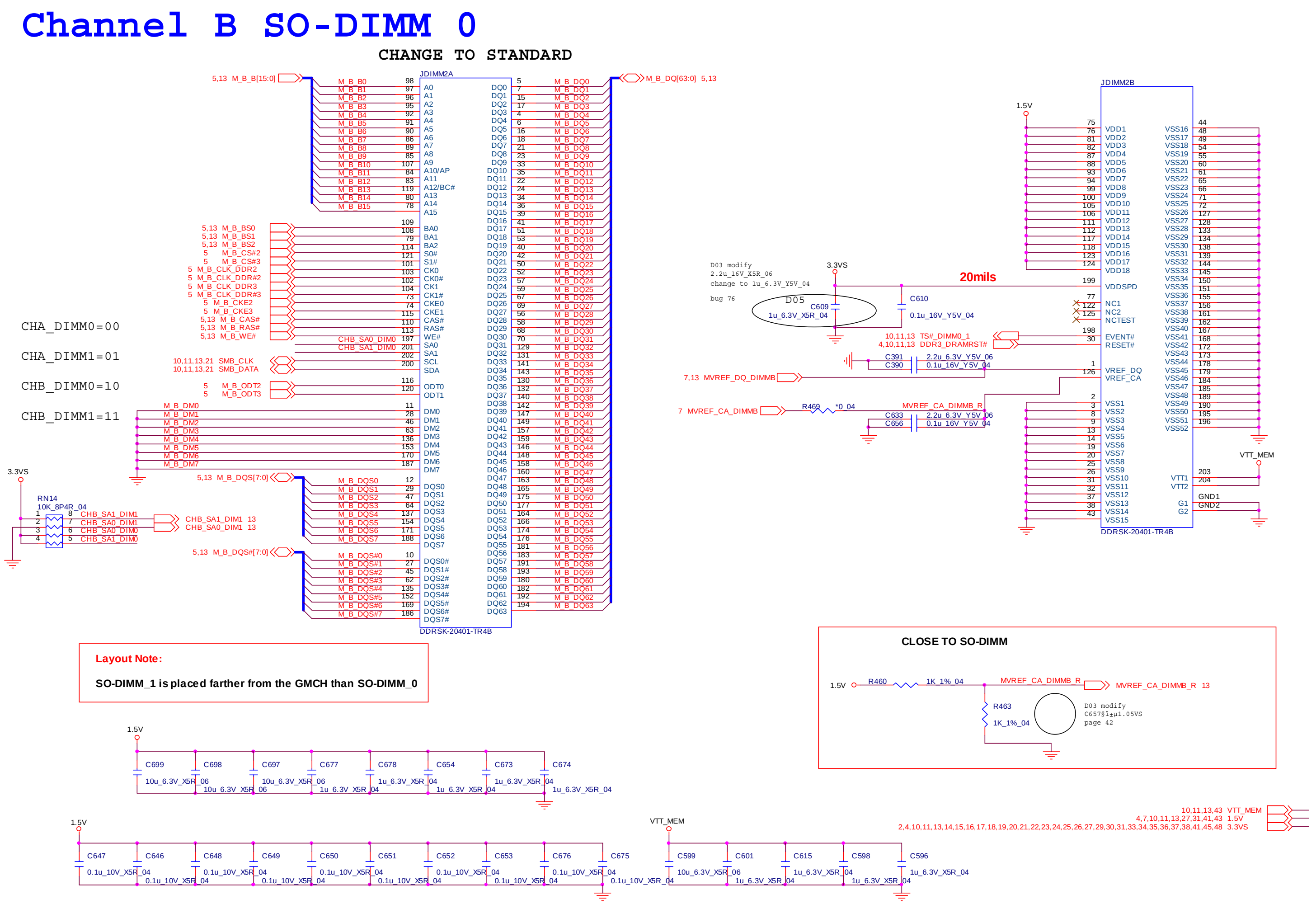
Sheet 10 of 61
DDRIII CHA SO-DIMM _0

DDRIII CHA SO-DIMM_1

Sheet 11 of 61
DDRIII CHA SO-DIMM _1



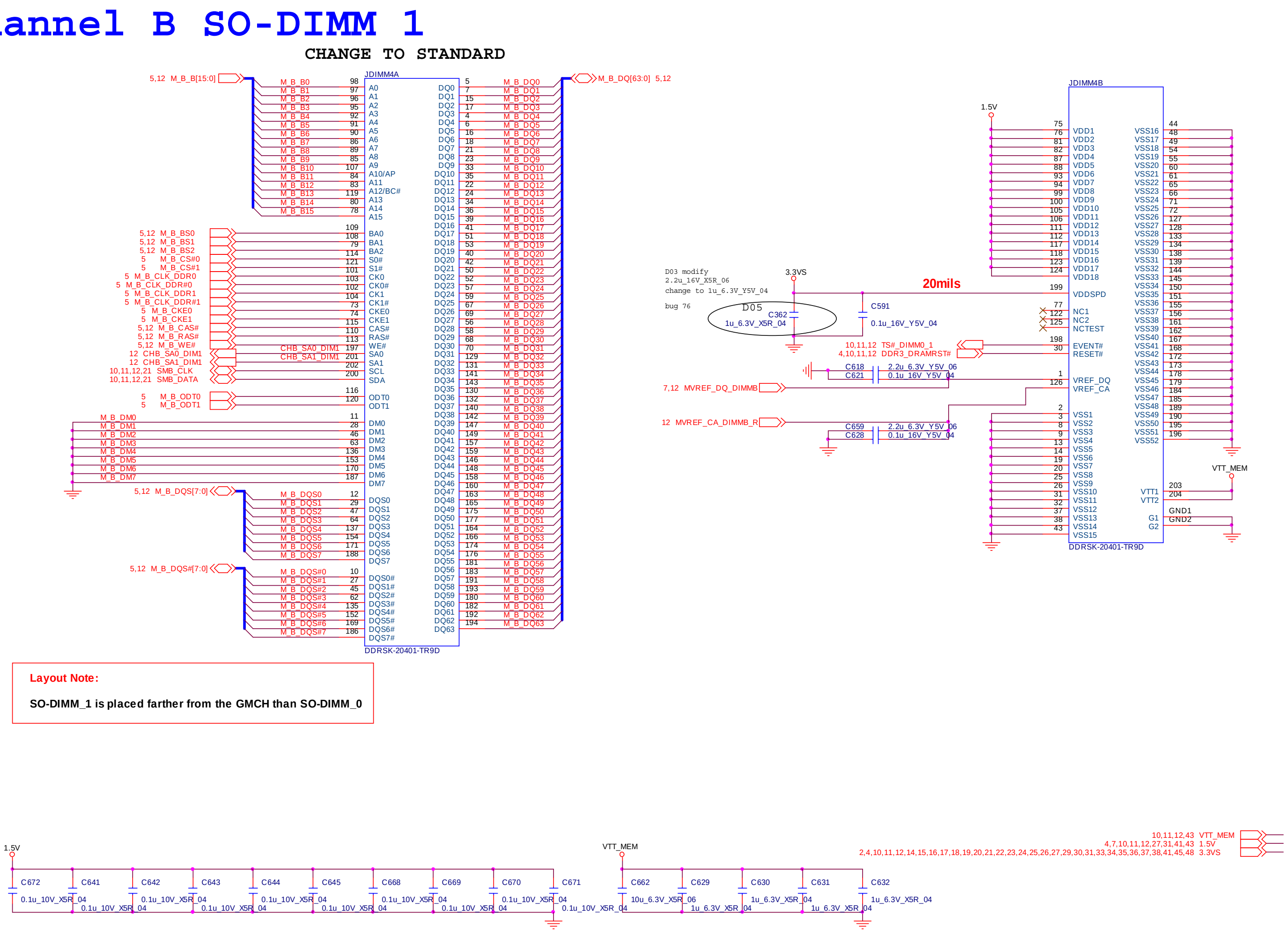
DDRIII CHB SO-DIMM_0



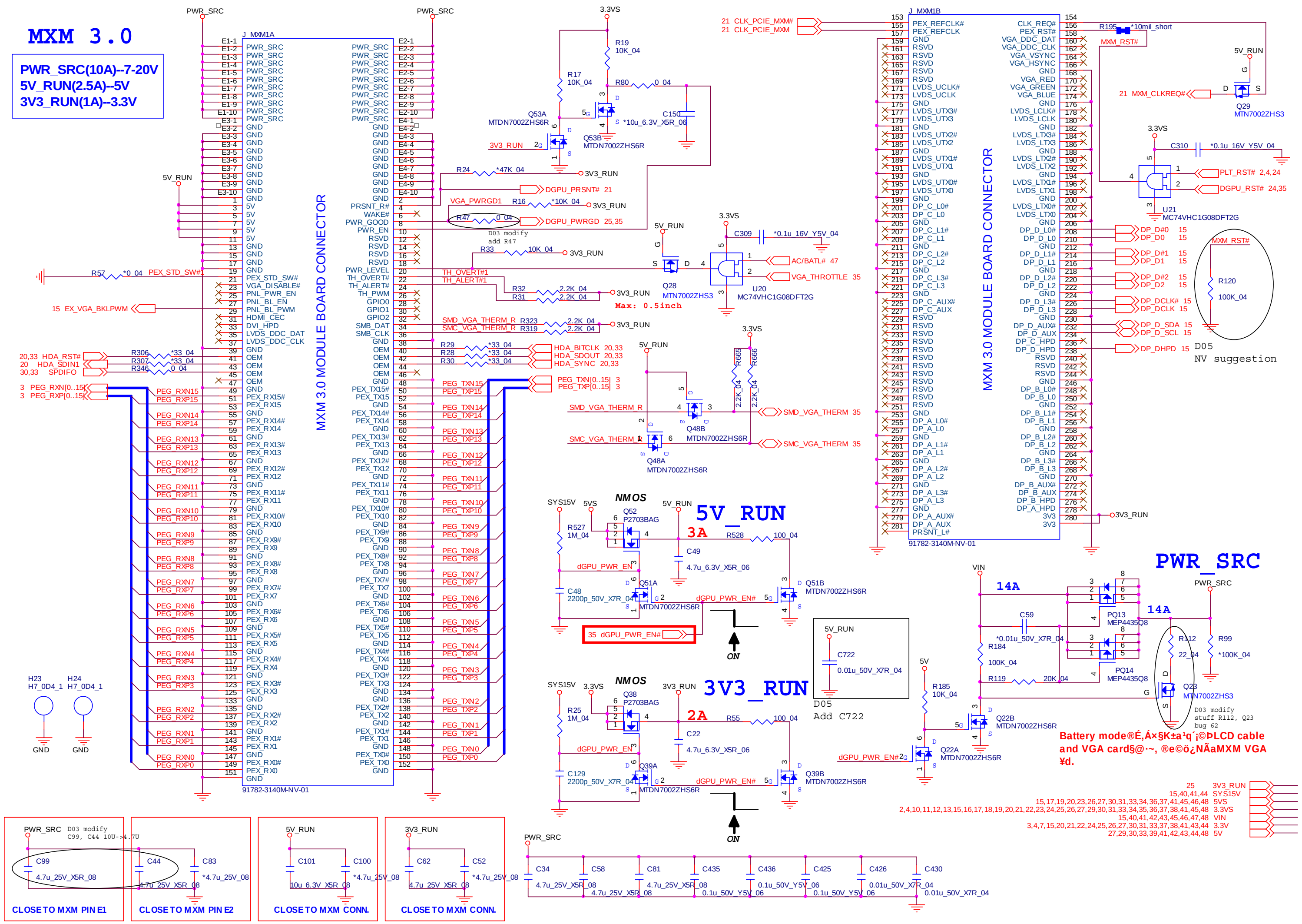
Sheet 12 of 61
DDRIII CHB SO-DIMM _0

DDRIII CHB SO-DIMM_1

Sheet 13 of 61
DDRIII CHB SO-DIMM _1



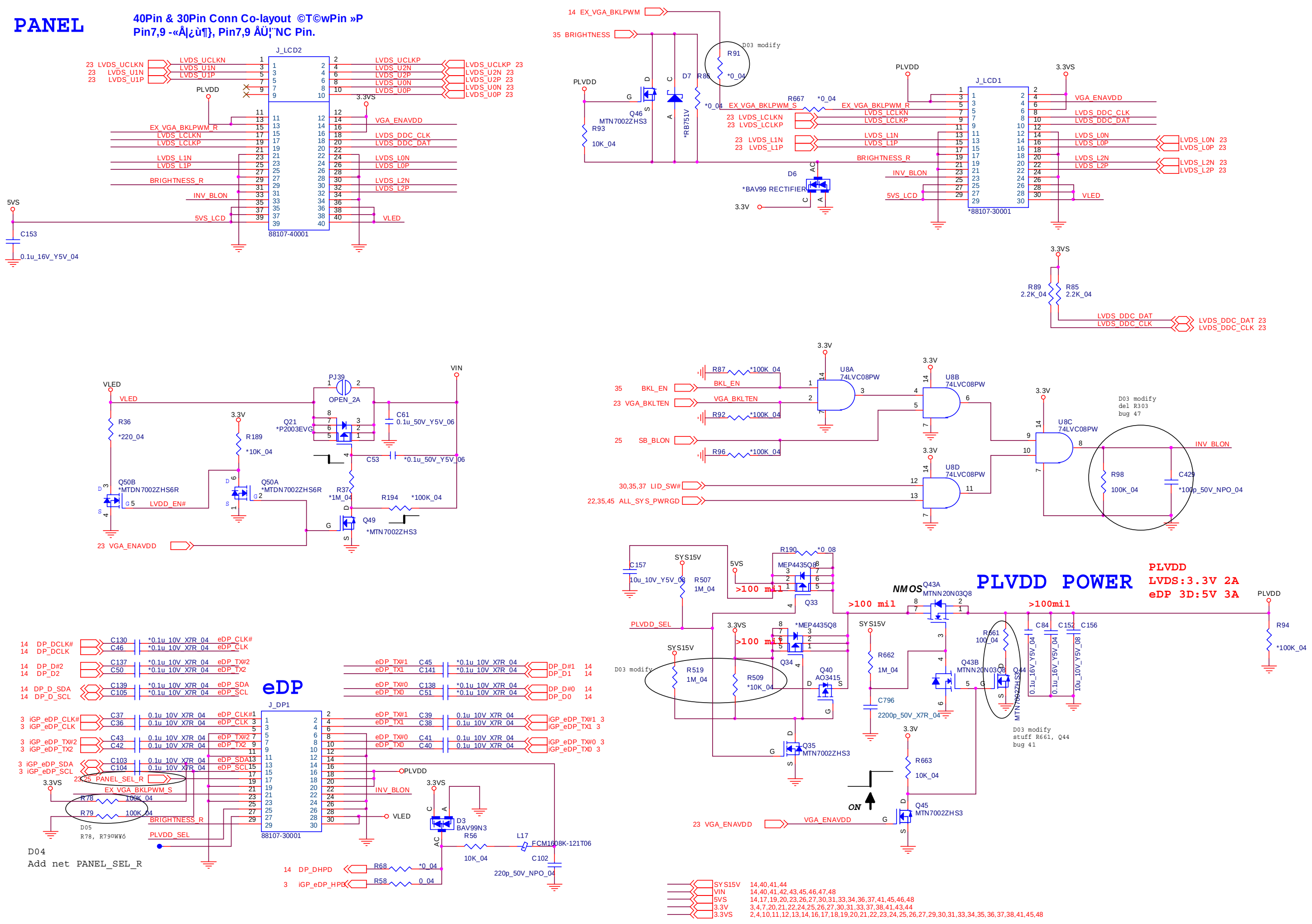
MXM PCI-E



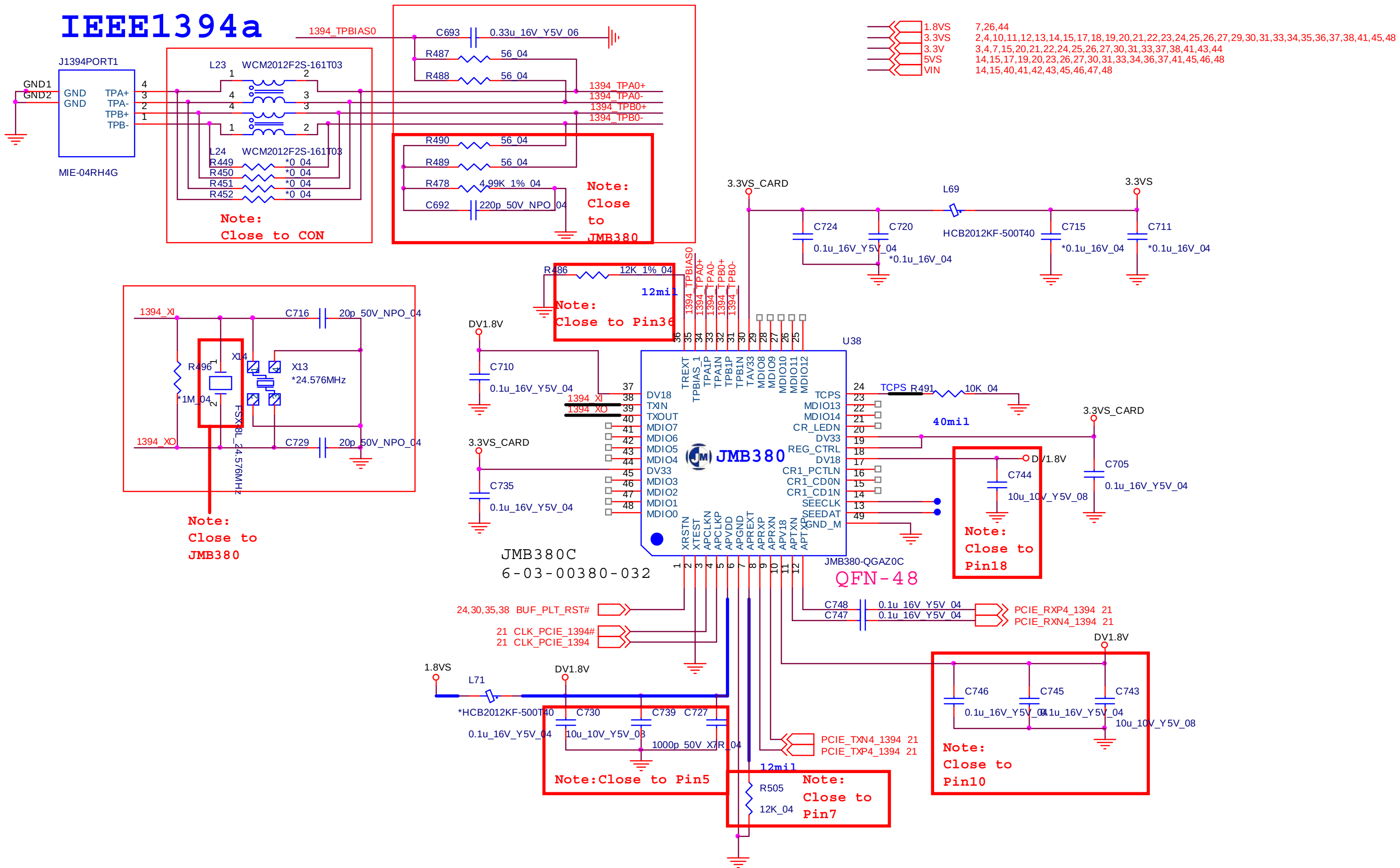
Sheet 14 of 61
MXM PCI-E

Panel, Inverter, CRT

Sheet 15 of 61
Panel, Inverter, CRT



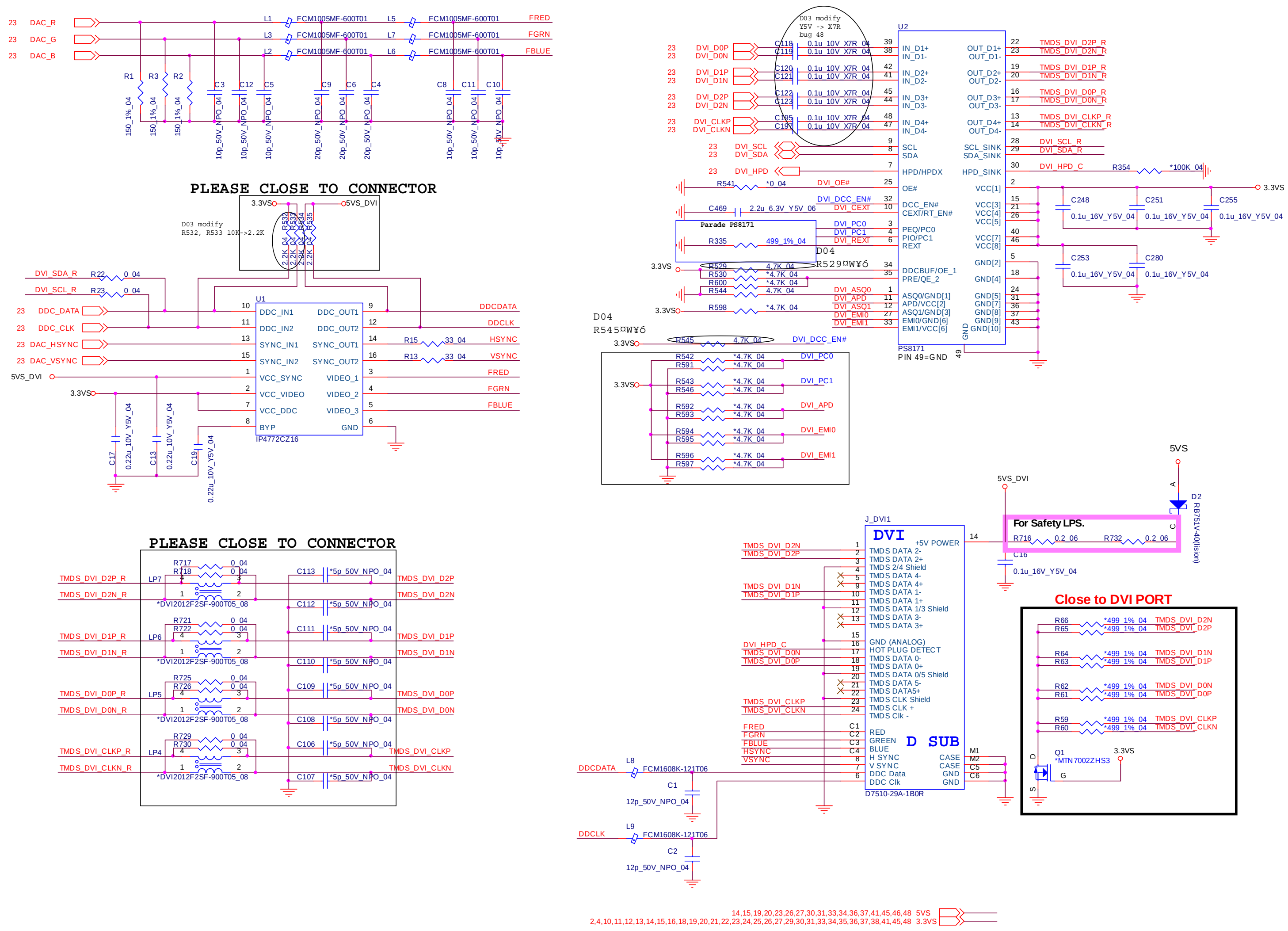
1394_JMB380C



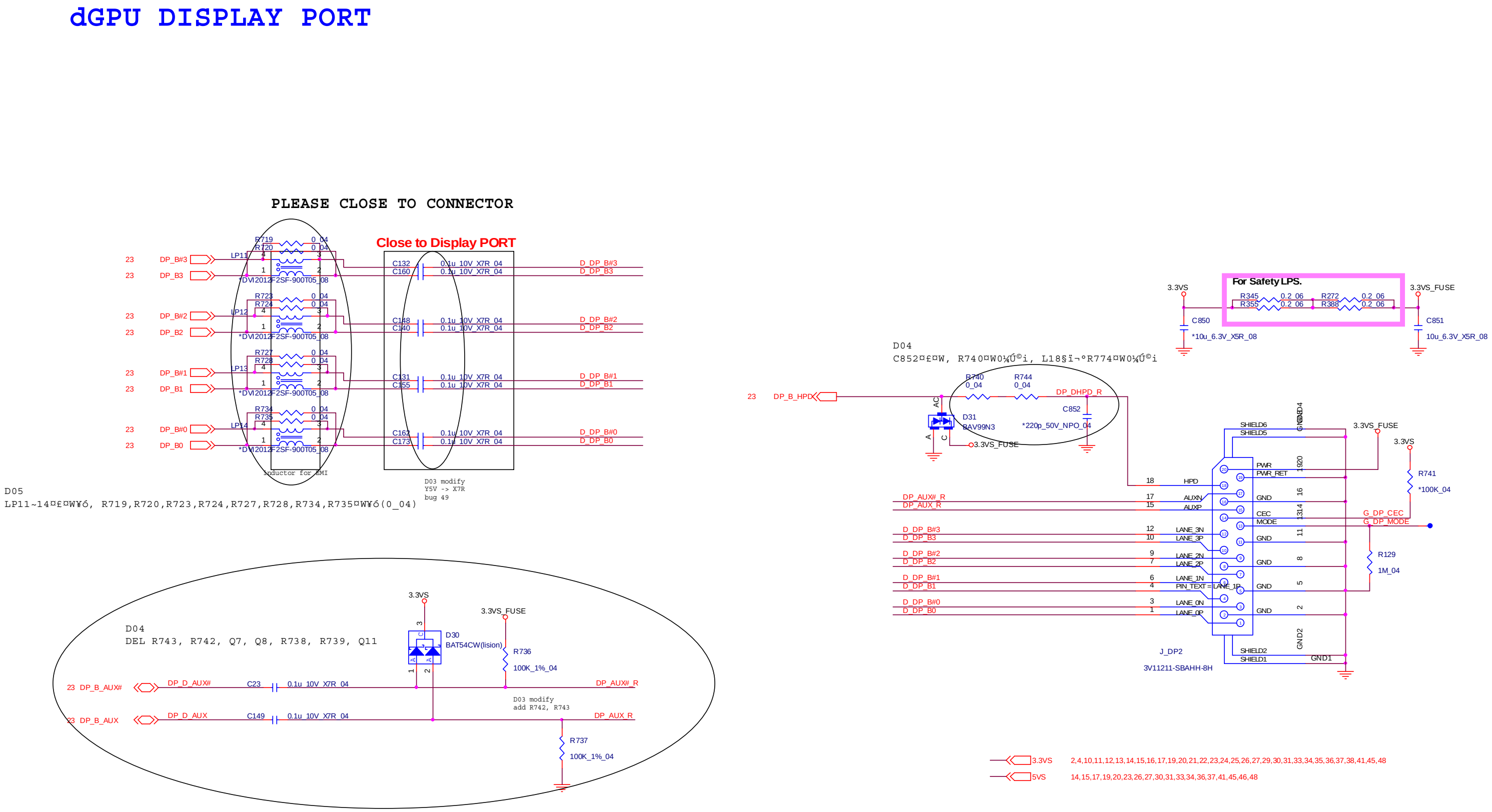
Sheet 16 of 61
1394_JMB380C

DVI

Sheet 17 of 61
DVI



Display Port

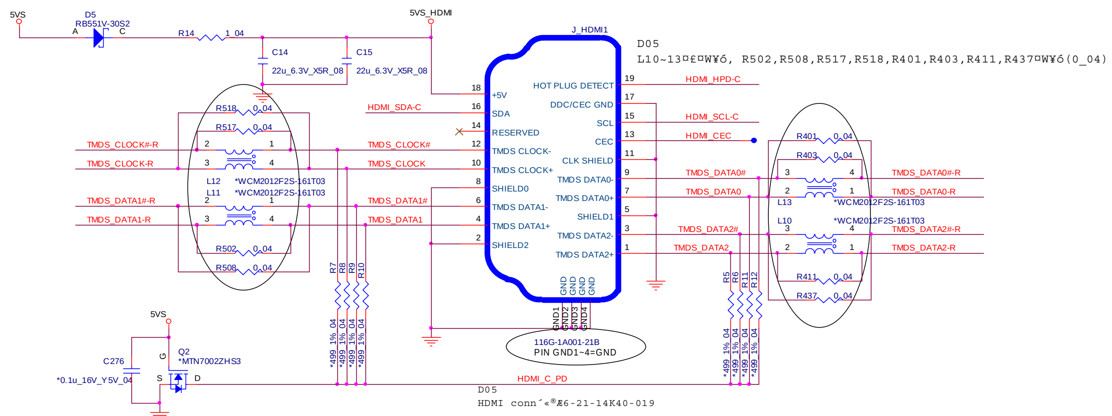


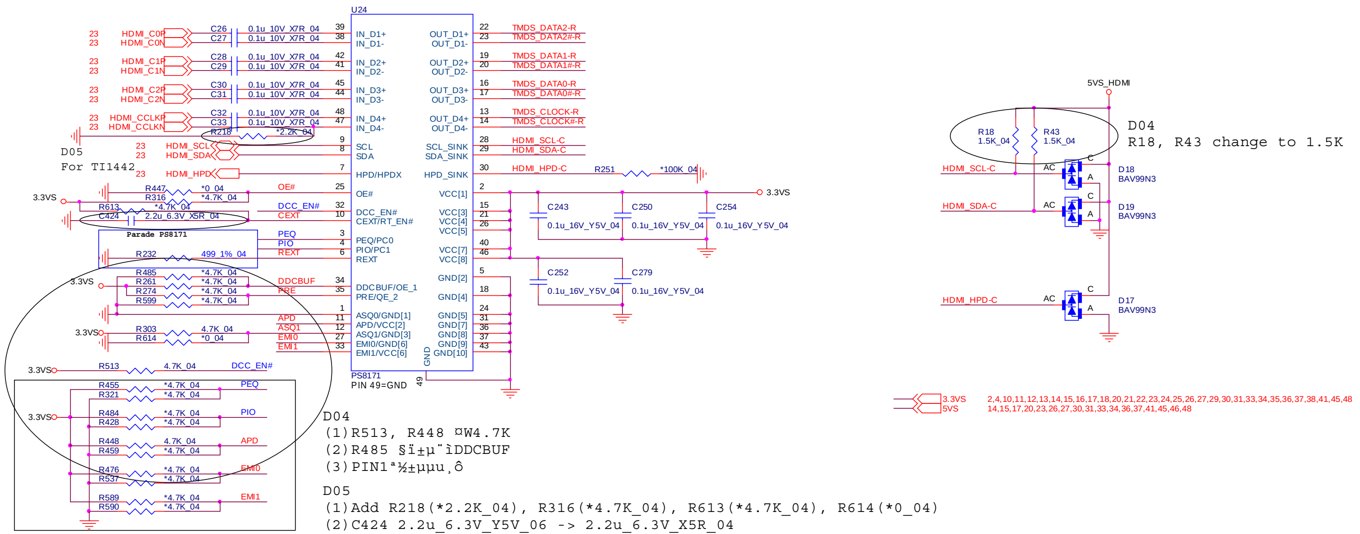
Sheet 18 of 61
Display Port

HDMI

Sheet 19 of 61
HDMI

HDMI CONNECTOR

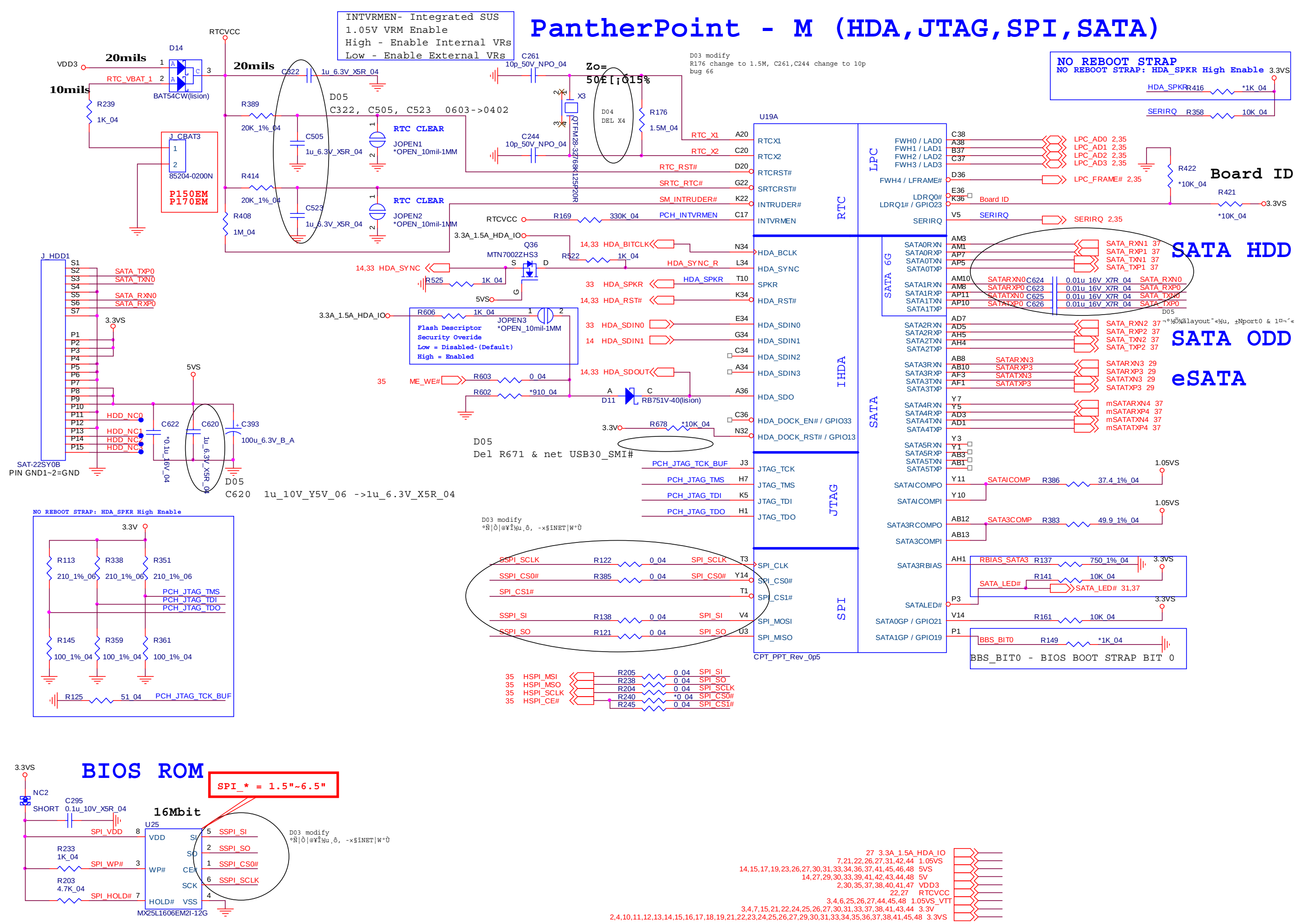




D04
(1)R513, R448 ¤W4.7K
(2)R485 §ï±µ¨ìDDCBUF
(3)PIN1ª½±µµu¸ô

D05
(1)Add R218(*2.2K_04), R316(*4.7K_04), R613(*4.7K_04), R614(*0_04)
(2)C424 2.2u_6.3V_Y5V_06 -> 2.2u_6.3V_X5R_04

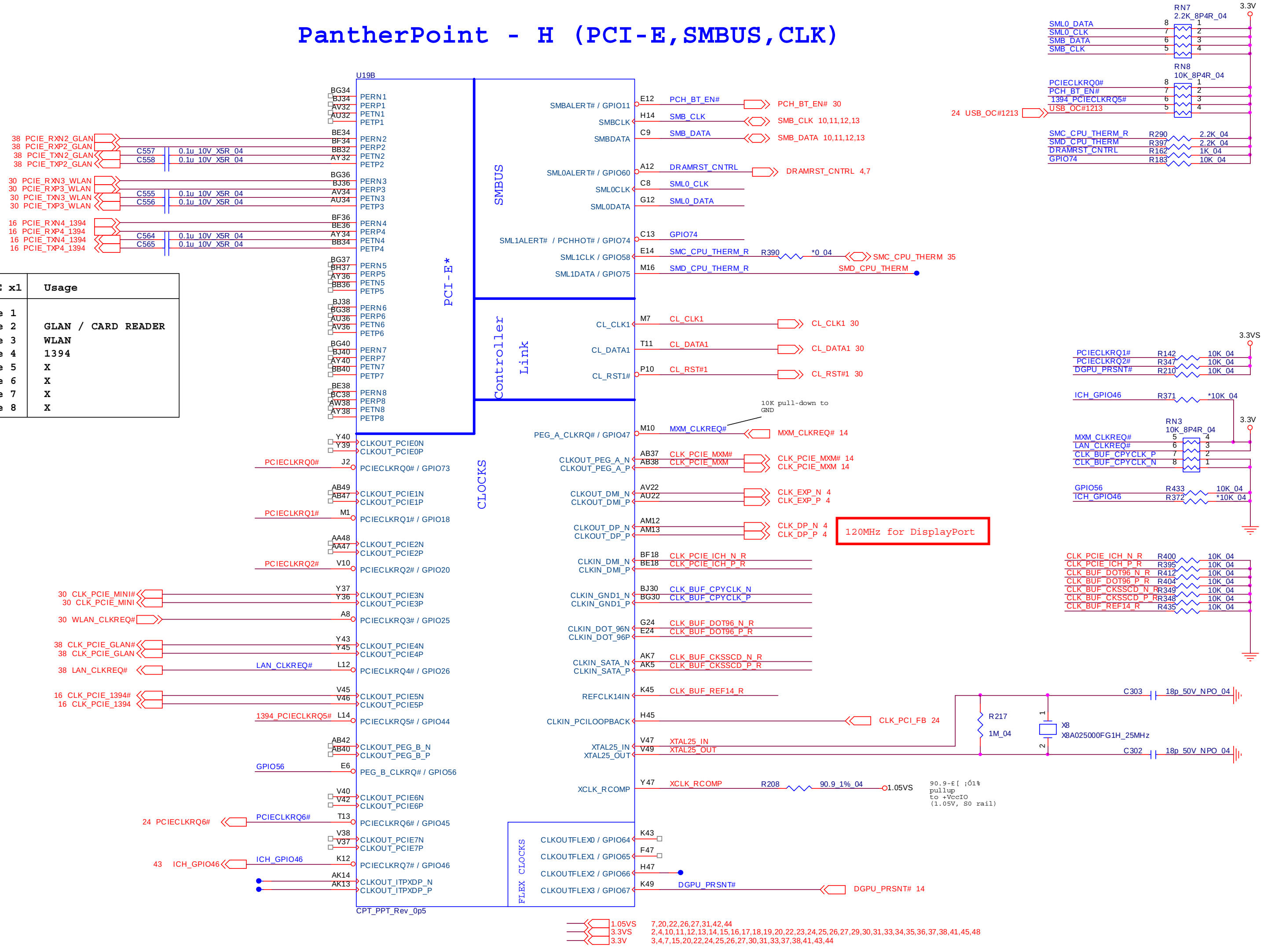
PCH 1/9 - RTC, HDA, SATA



Sheet 20 of 61
PCH 1/9 - RTC, HDA, SATA

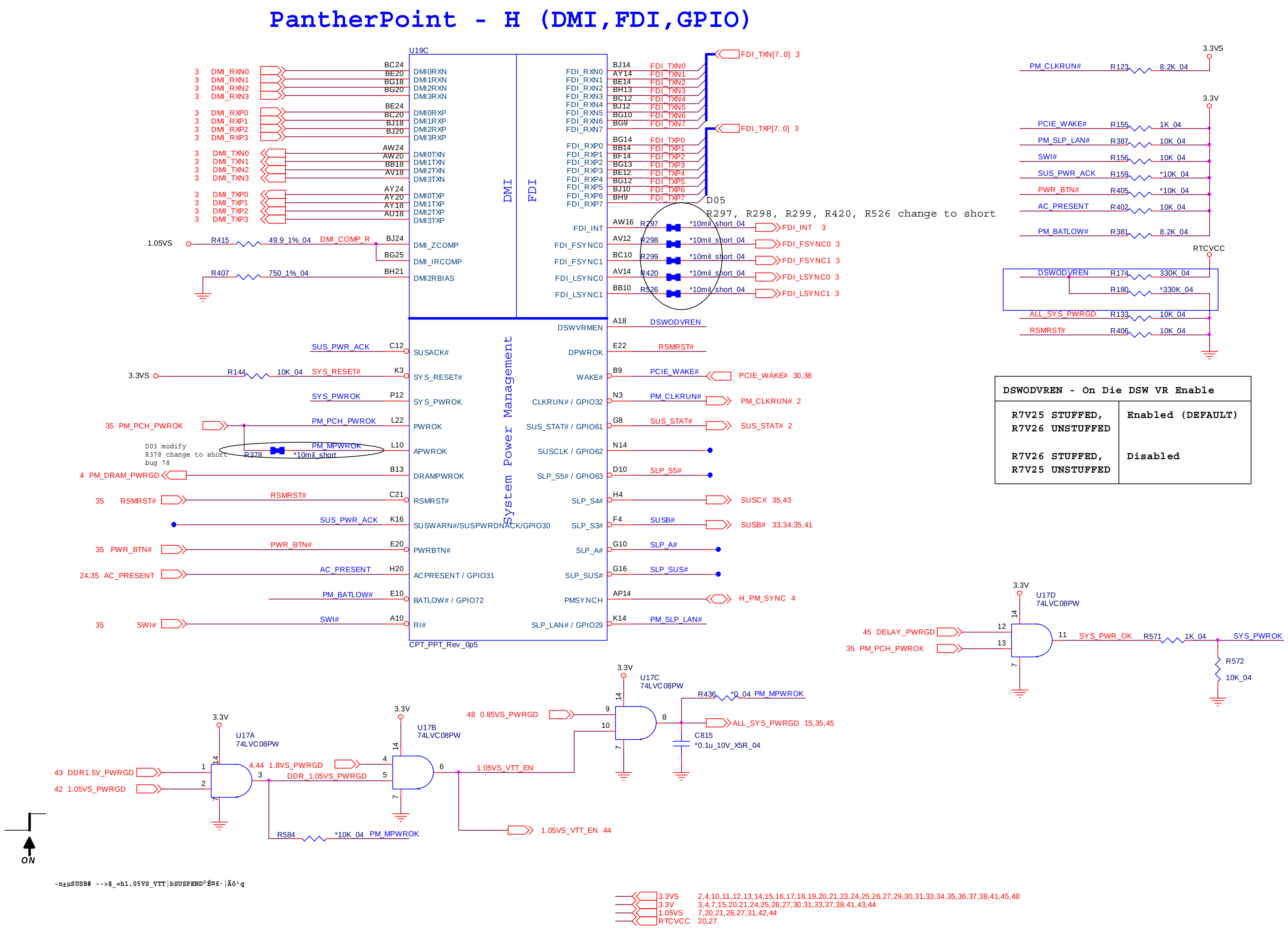
PCH 2/9 - PCIE, SMBUS, CLK

Sheet 21 of 61
PCH 2/9 - PCIE, SMBUS, CLK



PCI-E x1	Usage
Lane 1	
Lane 2	GLAN / CARD READER
Lane 3	WLAN
Lane 4	1394
Lane 5	X
Lane 6	X
Lane 7	X
Lane 8	X

PCH3/9 - DMI, FDI, PWRGD

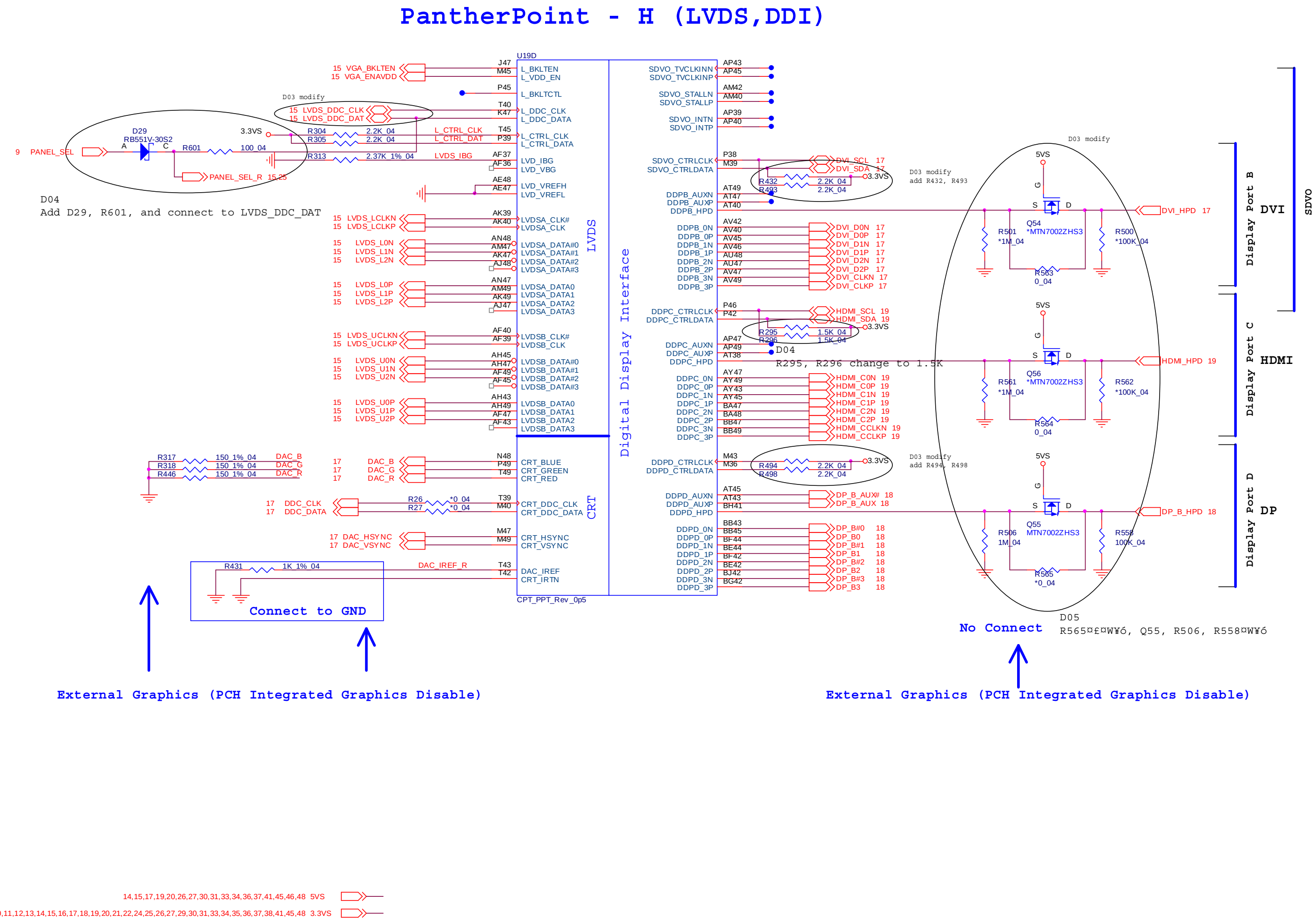


DSWODVREN - On Die DSW VR Enable	
R7V25 STUFFED, R7V26 UNSTUFFED	Enabled (DEFAULT)
R7V26 STUFFED, R7V25 UNSTUFFED	Disabled

Sheet 22 of 61
PCH 3/9 - DMI, FDI, PWRGD

PCH 4/9 - LVDS, DDI, CRT

Sheet 23 of 61
PCH 4/9 - LVDS,
DDI, CRT



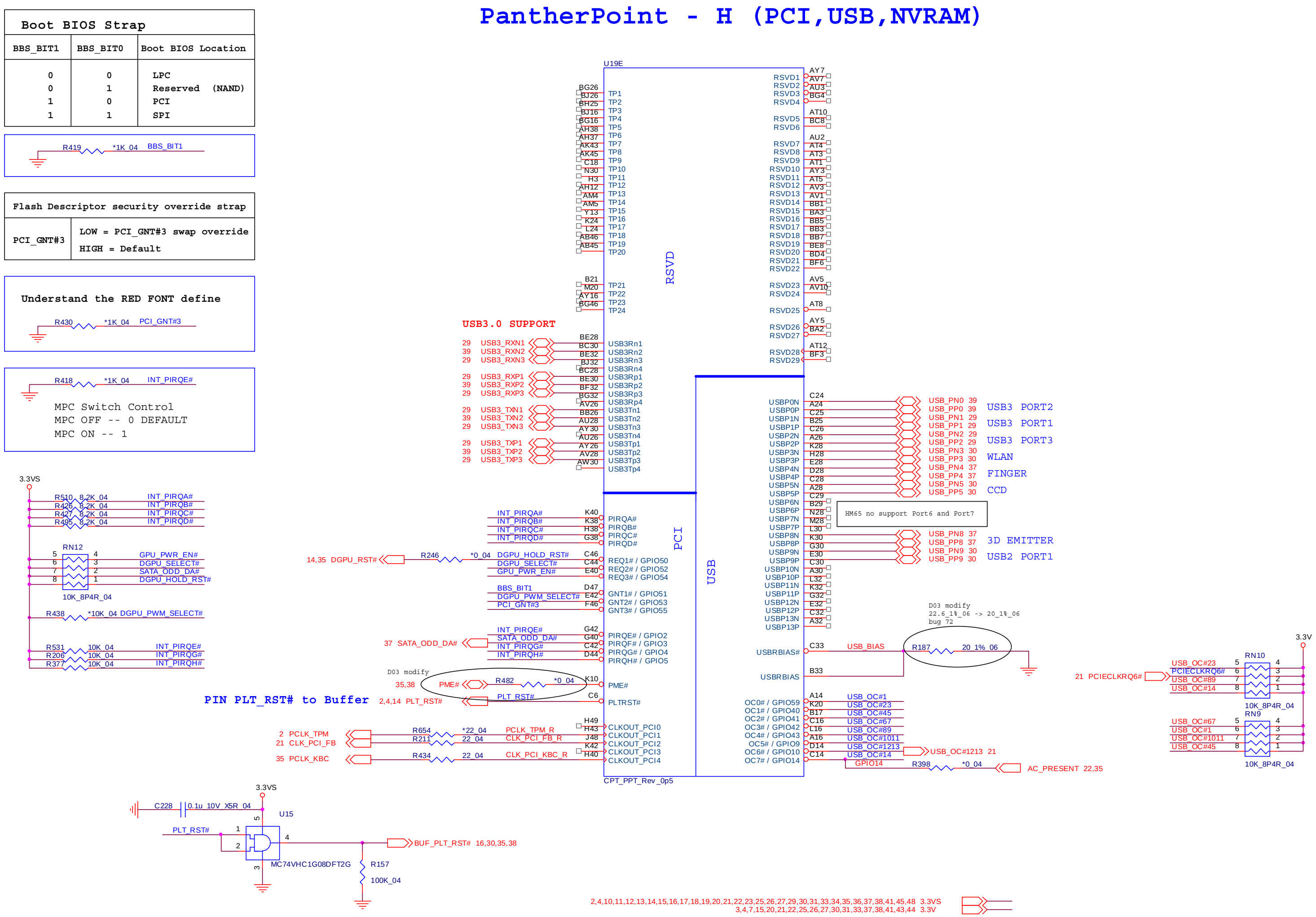
PCH 5/9 - PCI, USB, RSVD

Boot BIOS Strap		
BBS_BIT1	BBS_BIT0	Boot BIOS Location
0	0	LPC
0	1	Reserved (NAND)
1	0	PCI
1	1	SPI

Flash Descriptor security override strap	
PCI_GNT#3	LOW = PCI_GNT#3 swap override HIGH = Default

Understand the RED FONT define

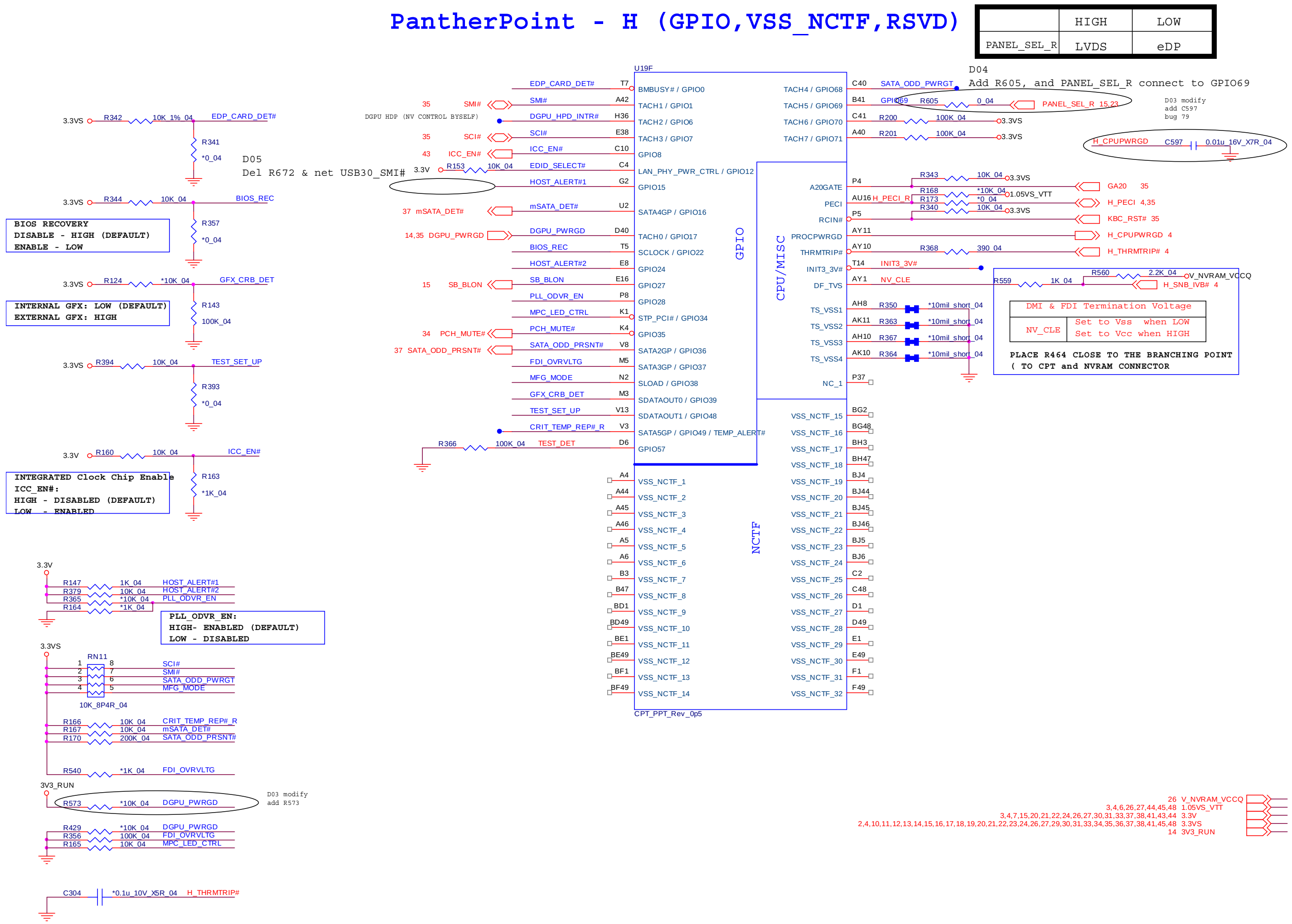
MPC Switch Control
MPC OFF -- 0 DEFAULT
MPC ON -- 1



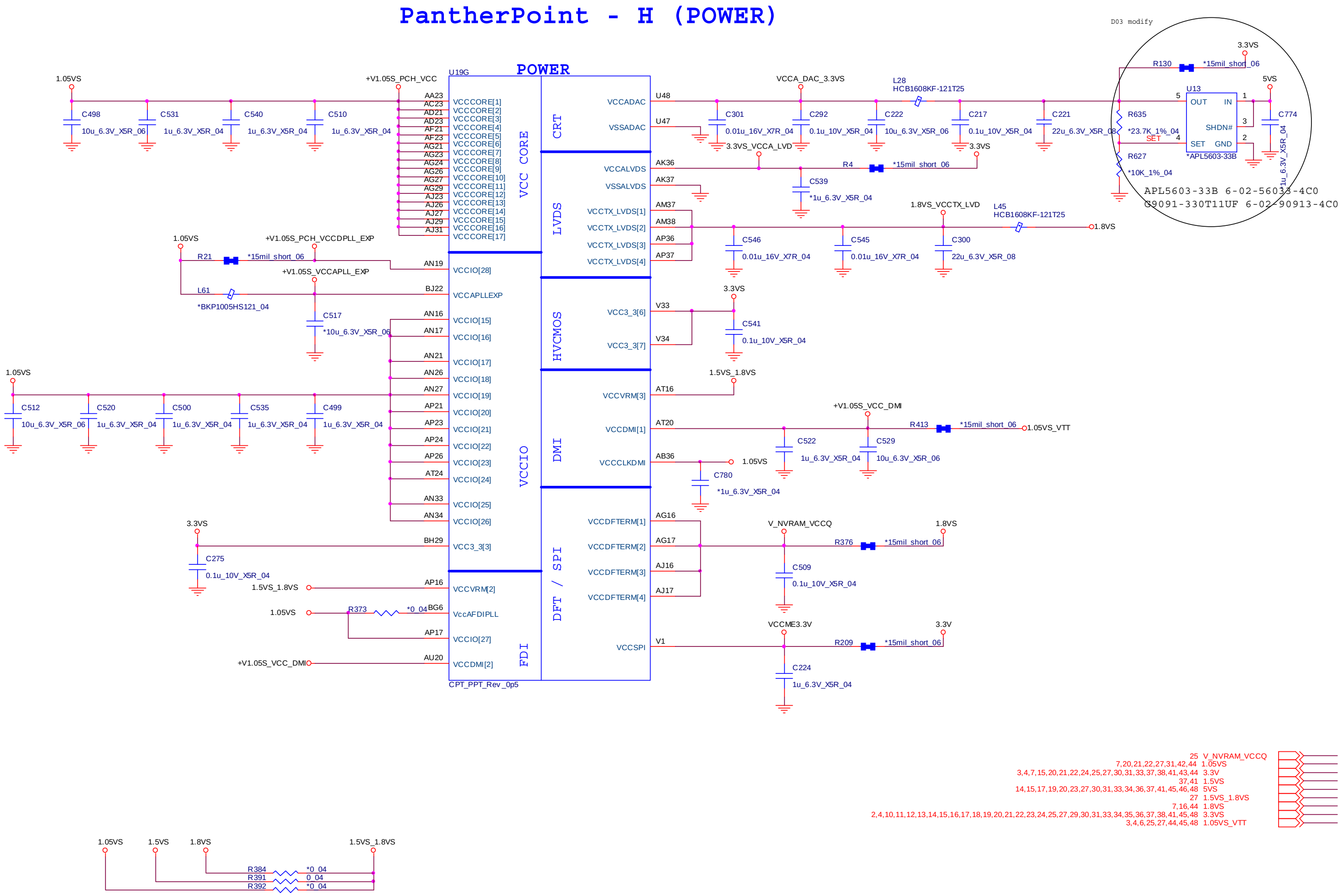
Sheet 24 of 61
PCH 5/9 - PCI, USB, RSVD

PCH 6/9 - GPIO, CPU

Sheet 25 of 61
PCH 6/9 - GPIO, CPU



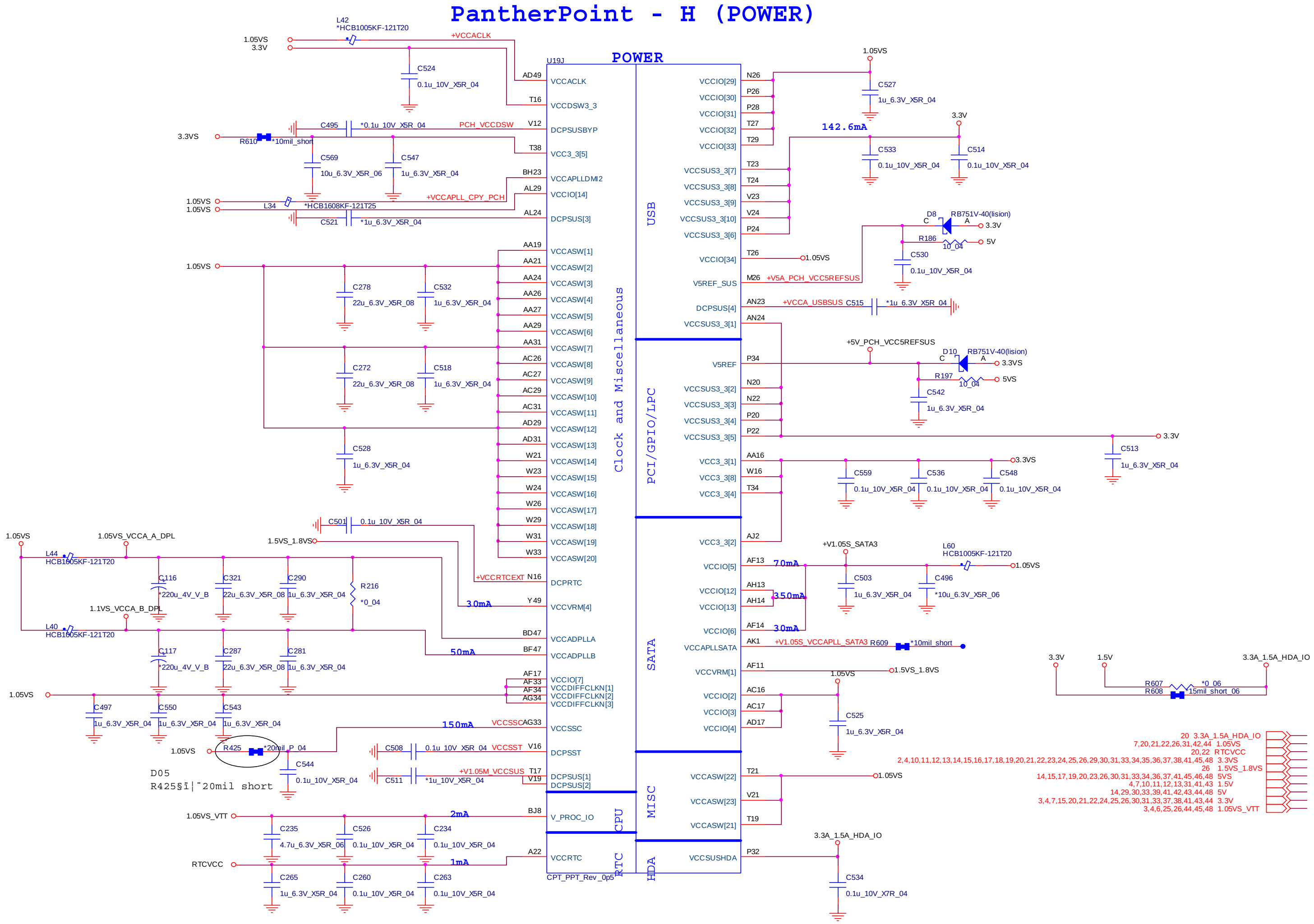
PCH 7/9 - Power



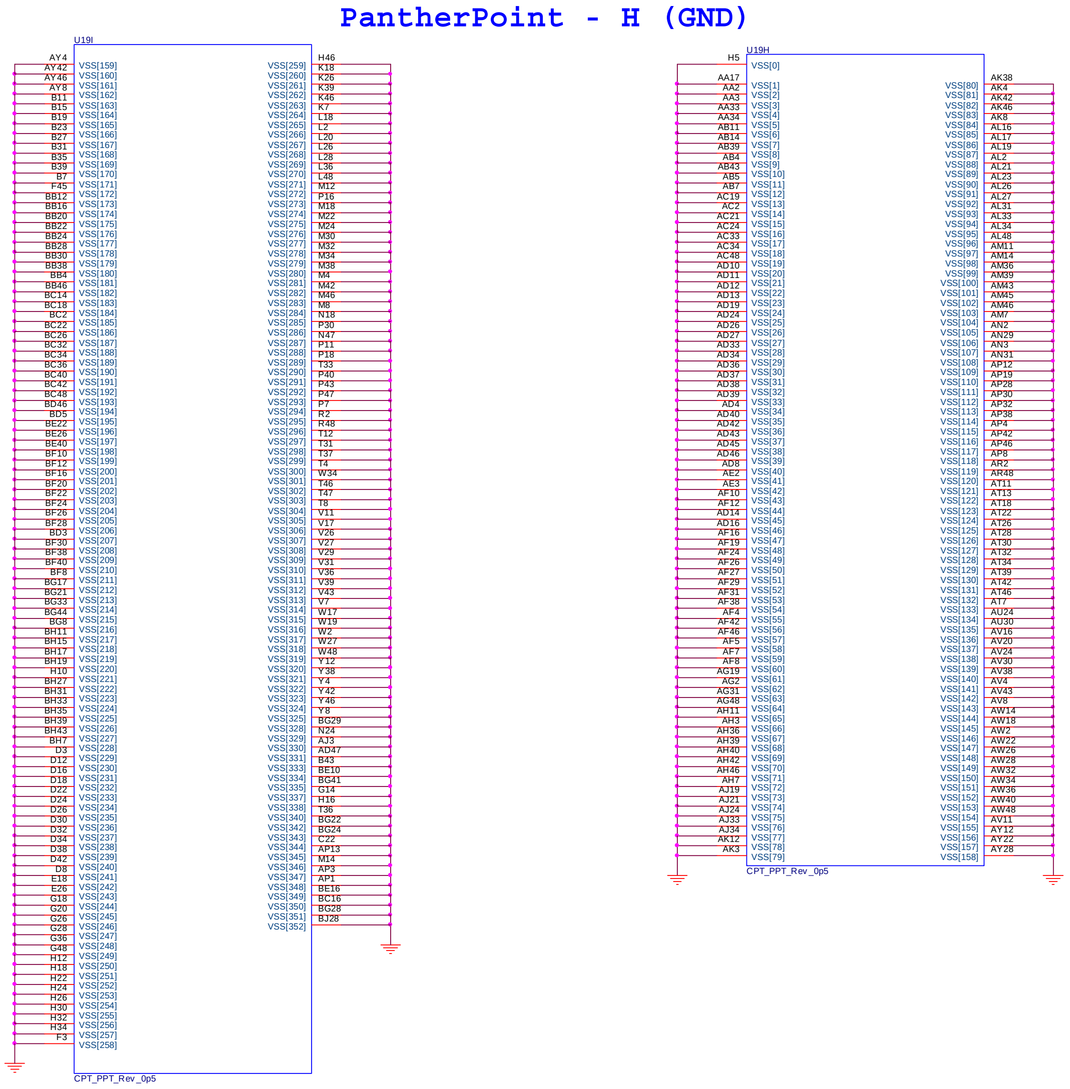
Sheet 26 of 61
PCH 7/9 - Power

PCH 8/9 - Power

Sheet 27 of 61
PCH 8/9 - Power



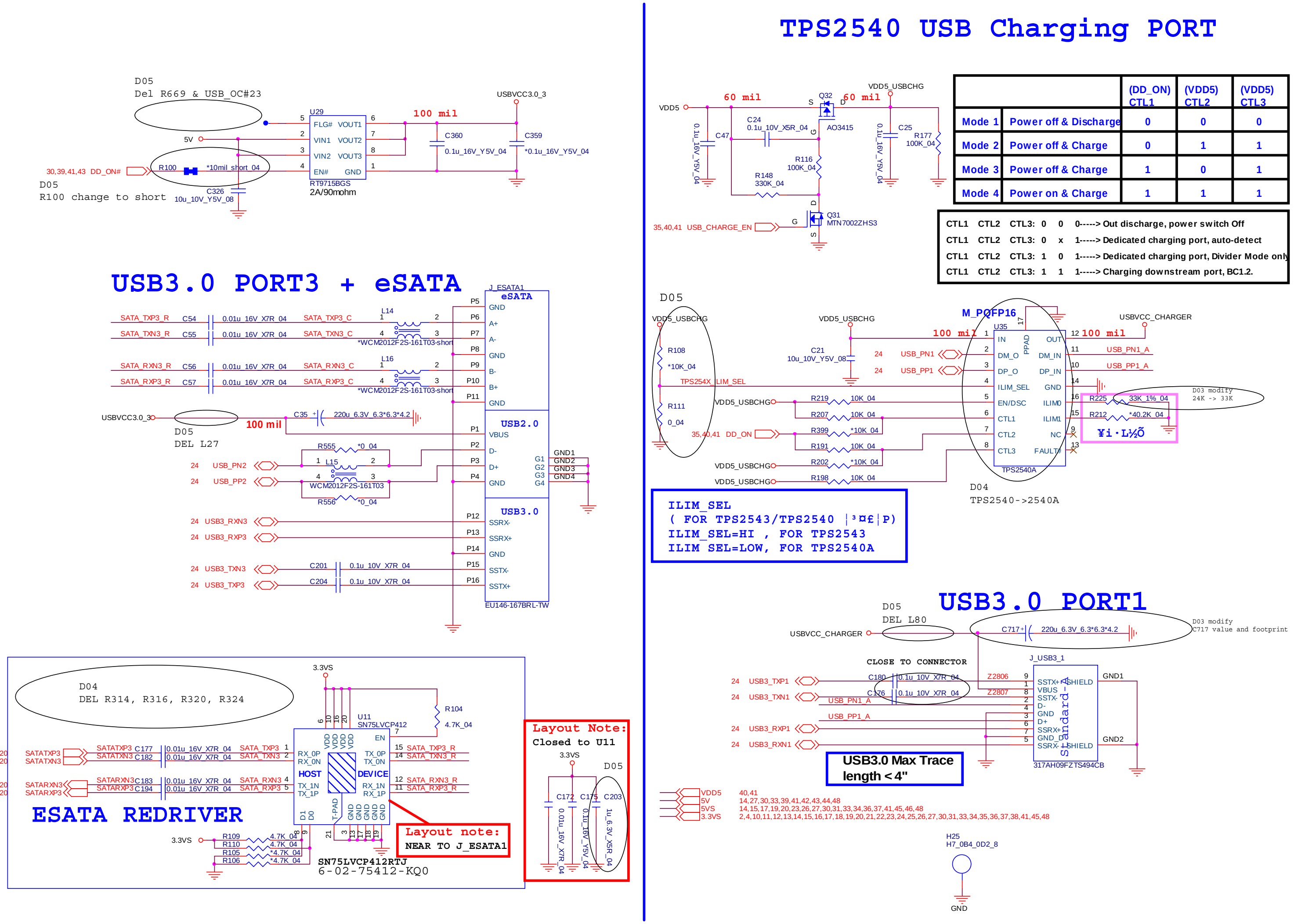
PCH 9/9 - GND



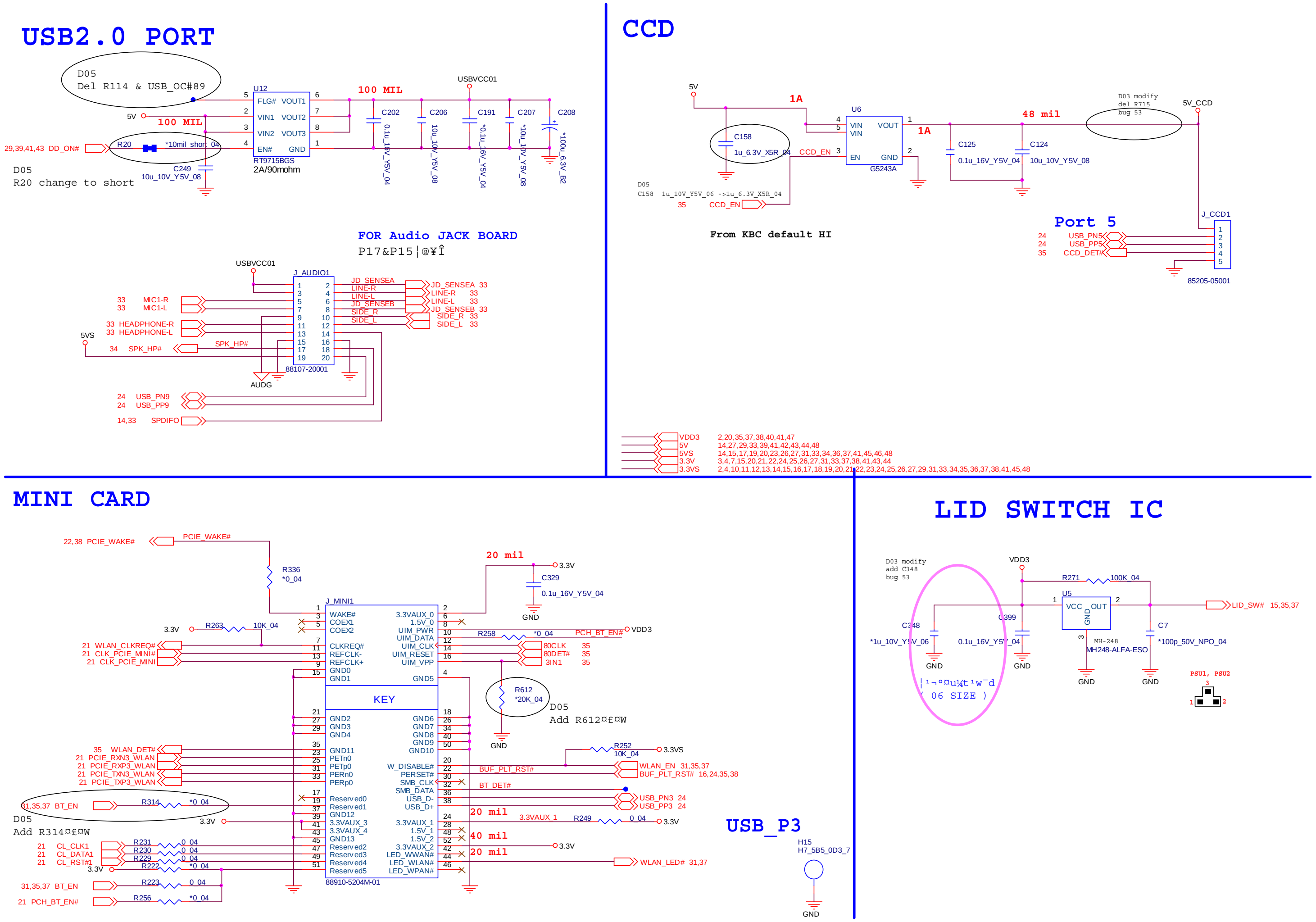
Sheet 28 of 61
PCH 9/9 - GND

USB+eSATA, USB Charging

Sheet 29 of 61
USB+eSATA, USB Charging



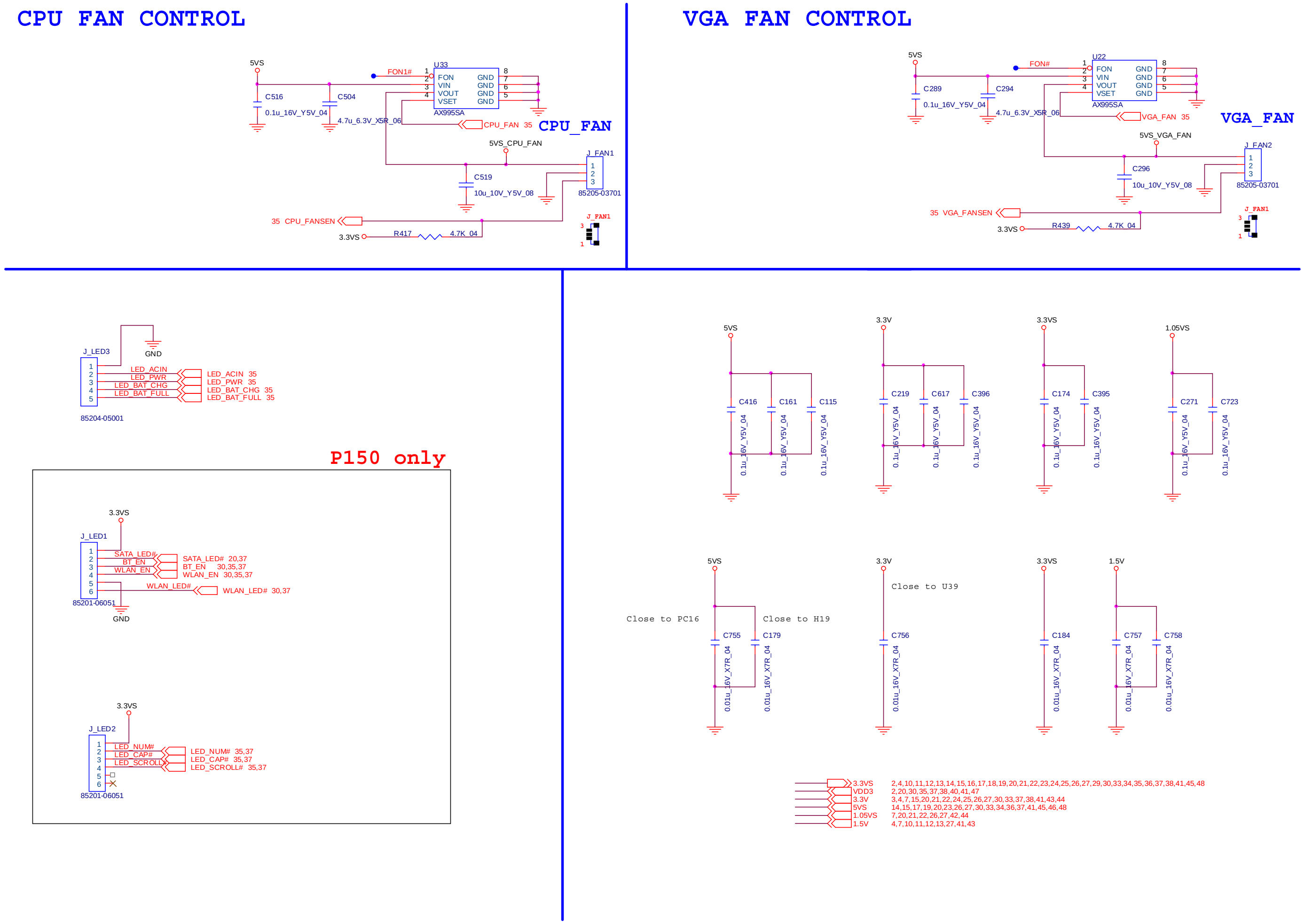
USB 2.0, CCD, Mini PCIE, LID



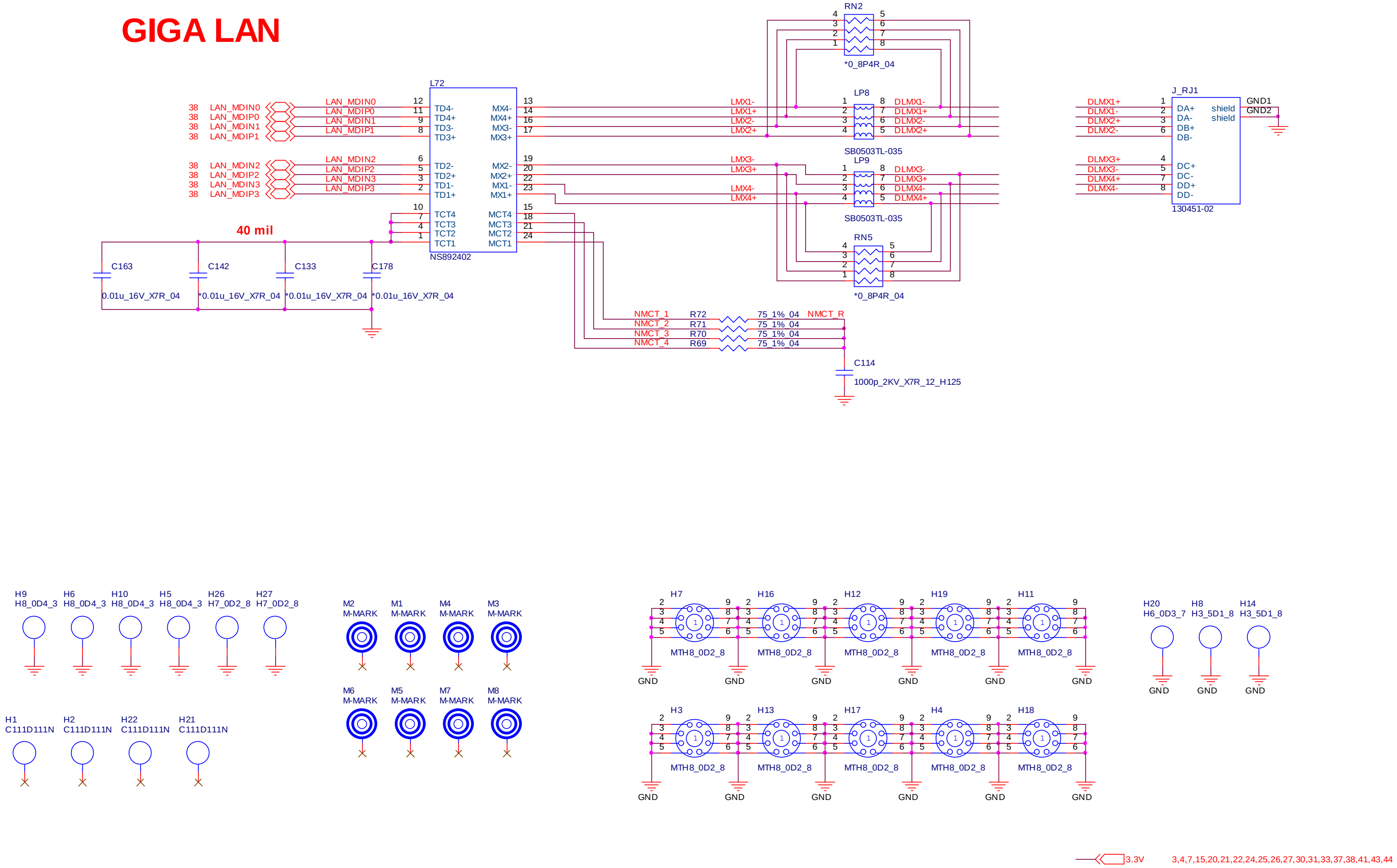
Sheet 30 of 61
USB 2.0, CCD,
Mini PCIE, LED

LED, Hotkey, LID SW, Fan

Sheet 31 of 61
LED, Hotkey, LID SW, Fan



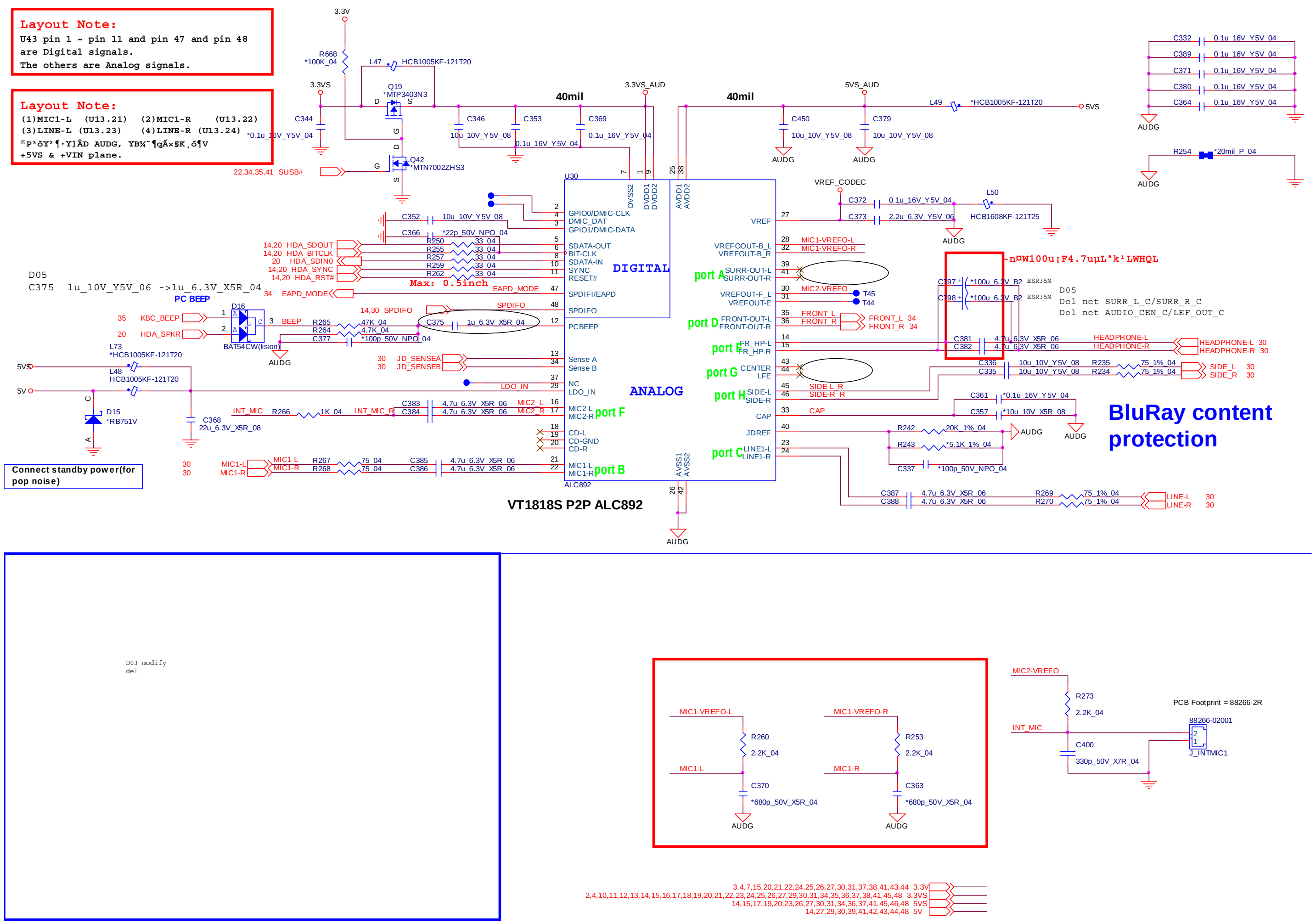
RJ 45



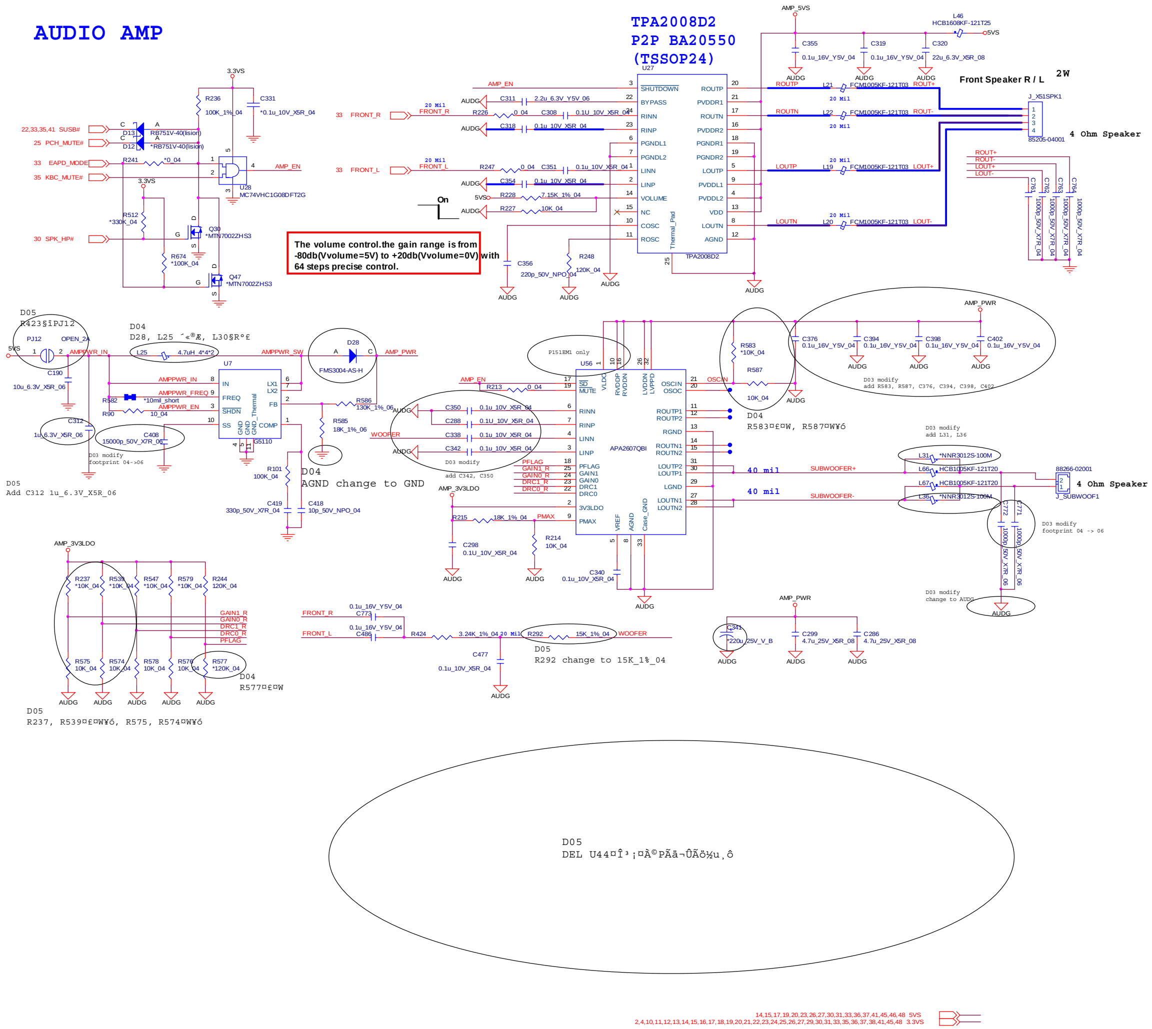
Sheet 32 of 61
RJ 45

Codec Realtek ALC892

Sheet 33 of 61
Codec Realtek ALC892



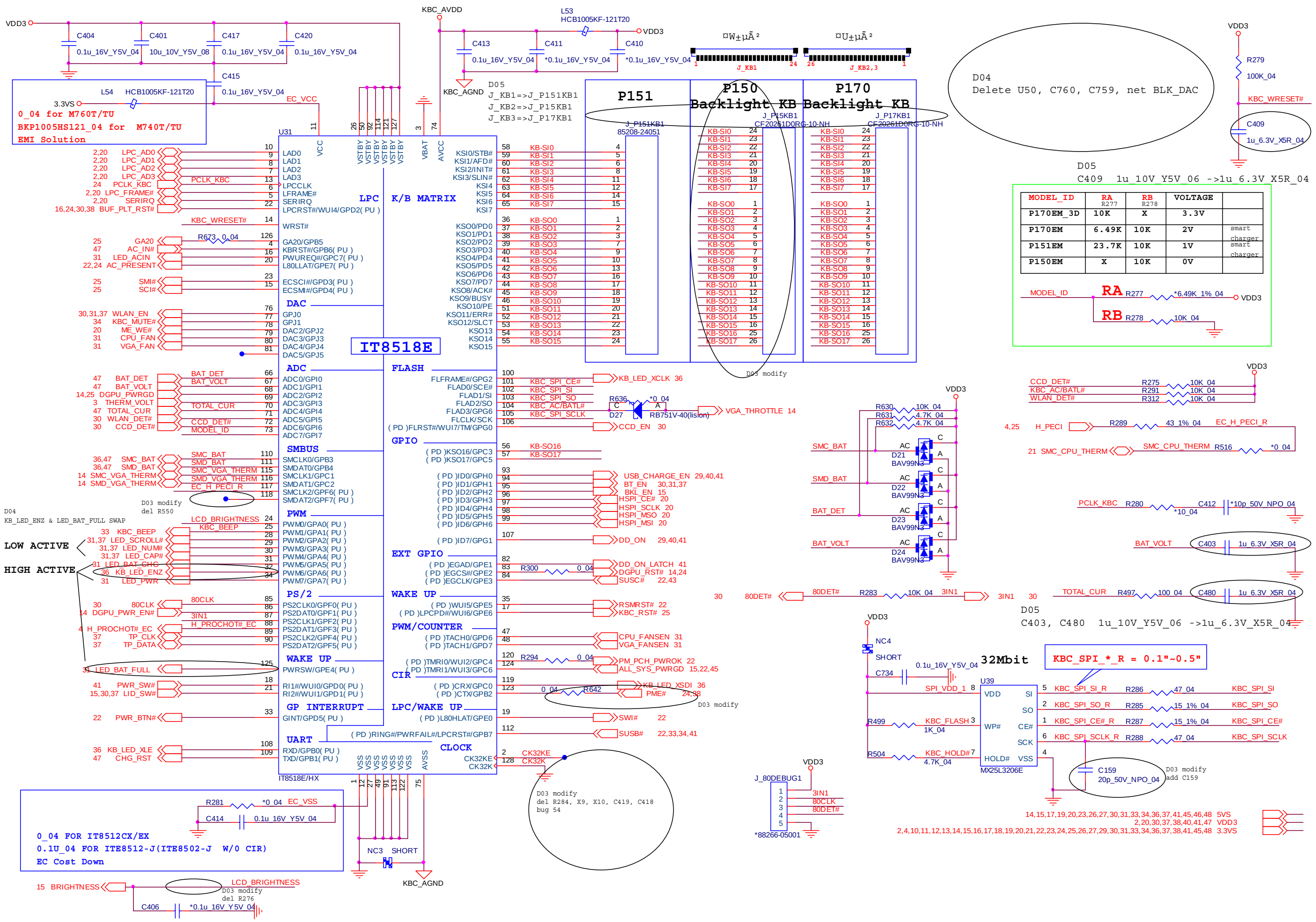
APA2607-TPA2008D2



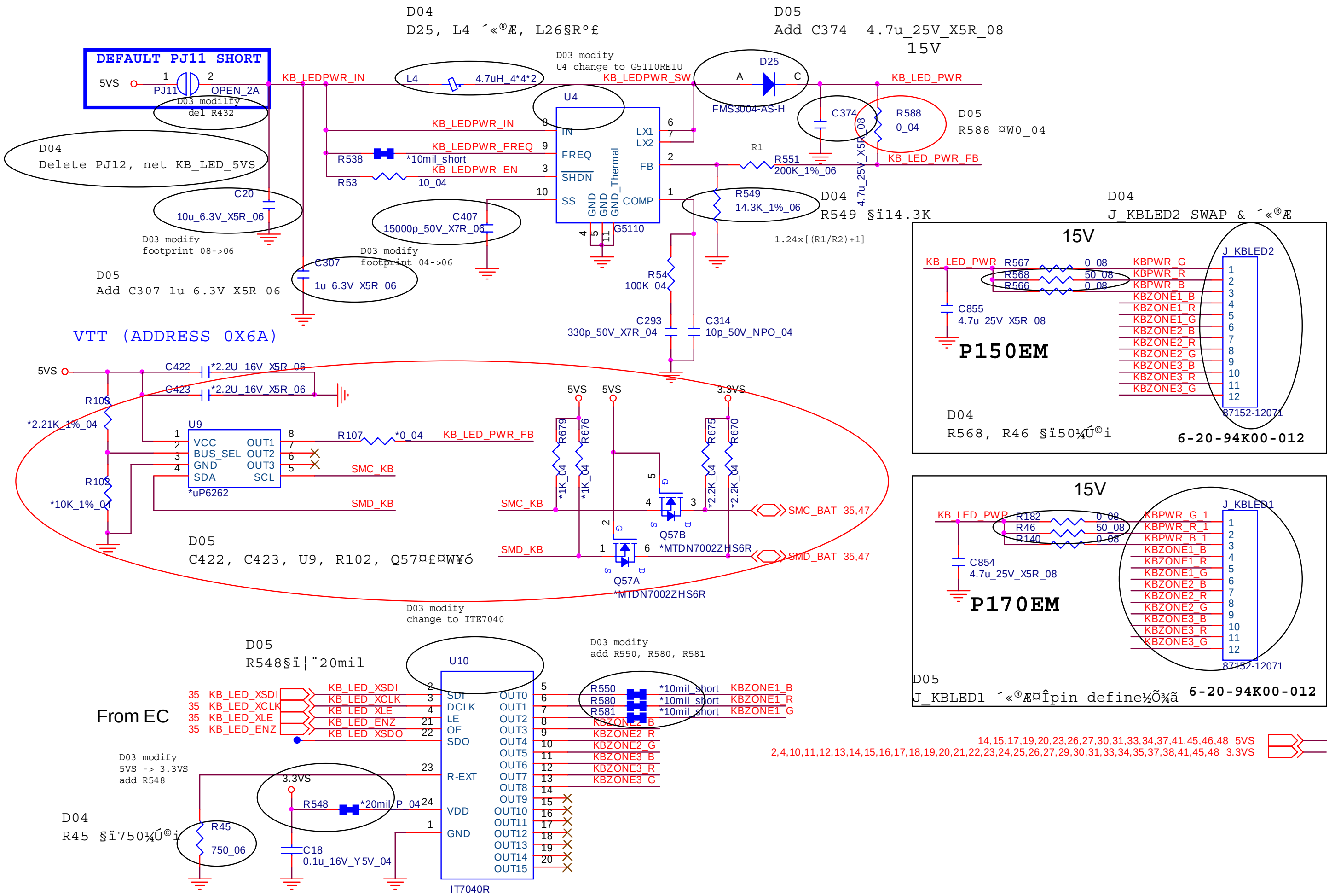
Sheet 34 of 61
APA2607-
TPA2008D2

KBC-ITE IT8518E

Sheet 35 of 61
KBC-ITE IT8518E



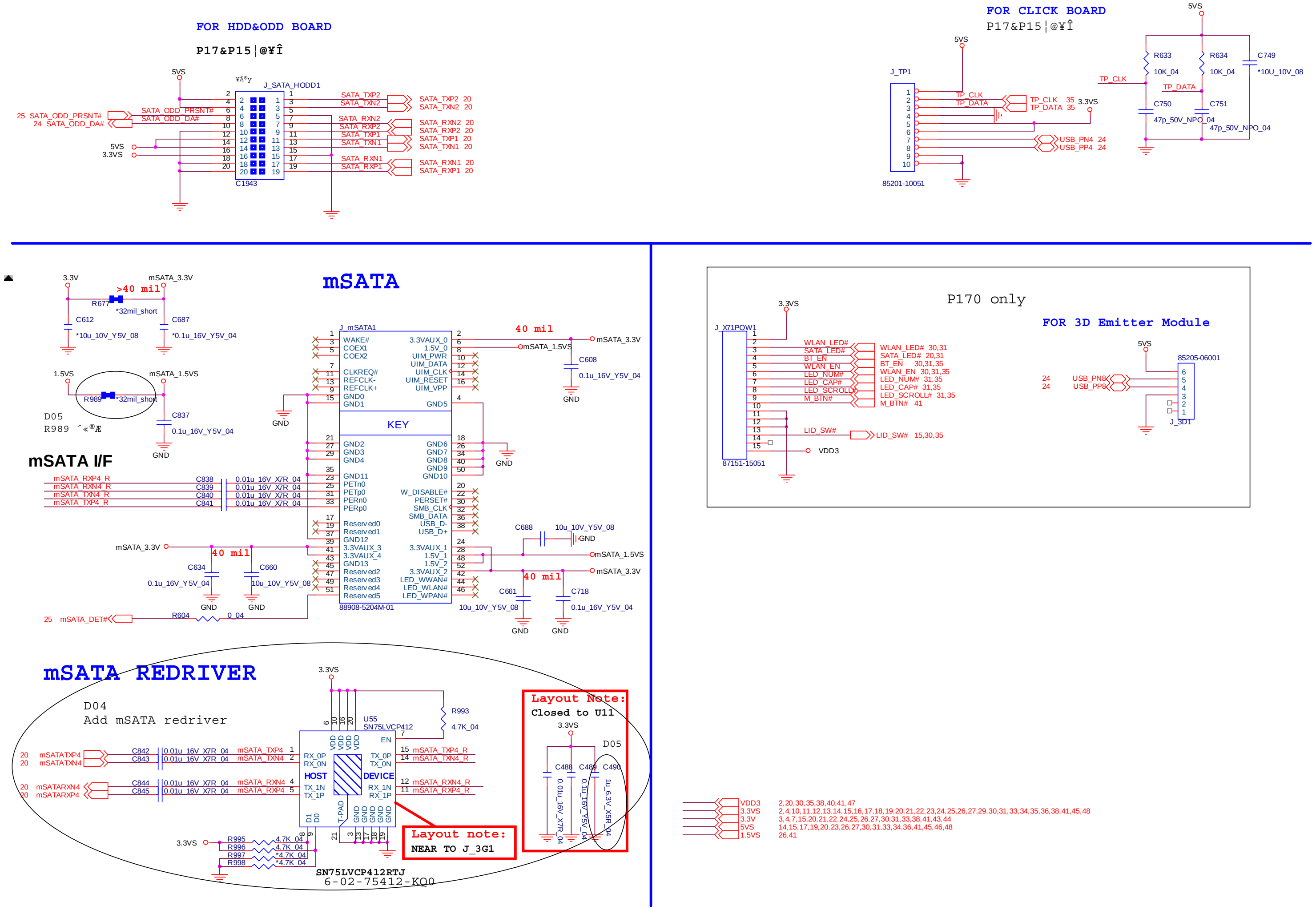
Backlight Keyboard



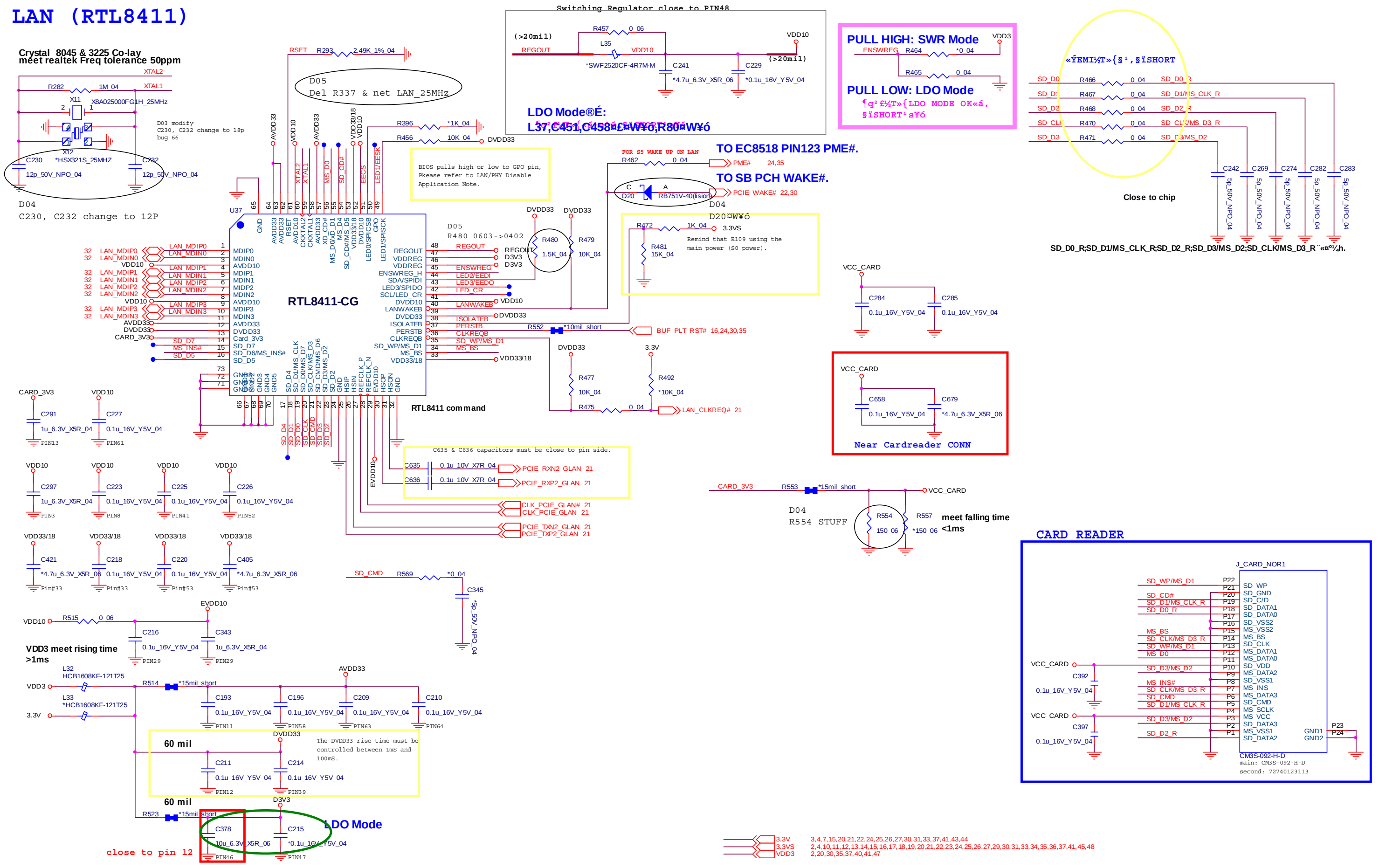
Sheet 36 of 61
Backlight
Keyboard

mSATA, FAN, TP, FP, MULTI-CON

Sheet 37 of 61
mSATA, FAN, TP, FP, MULTI-CON



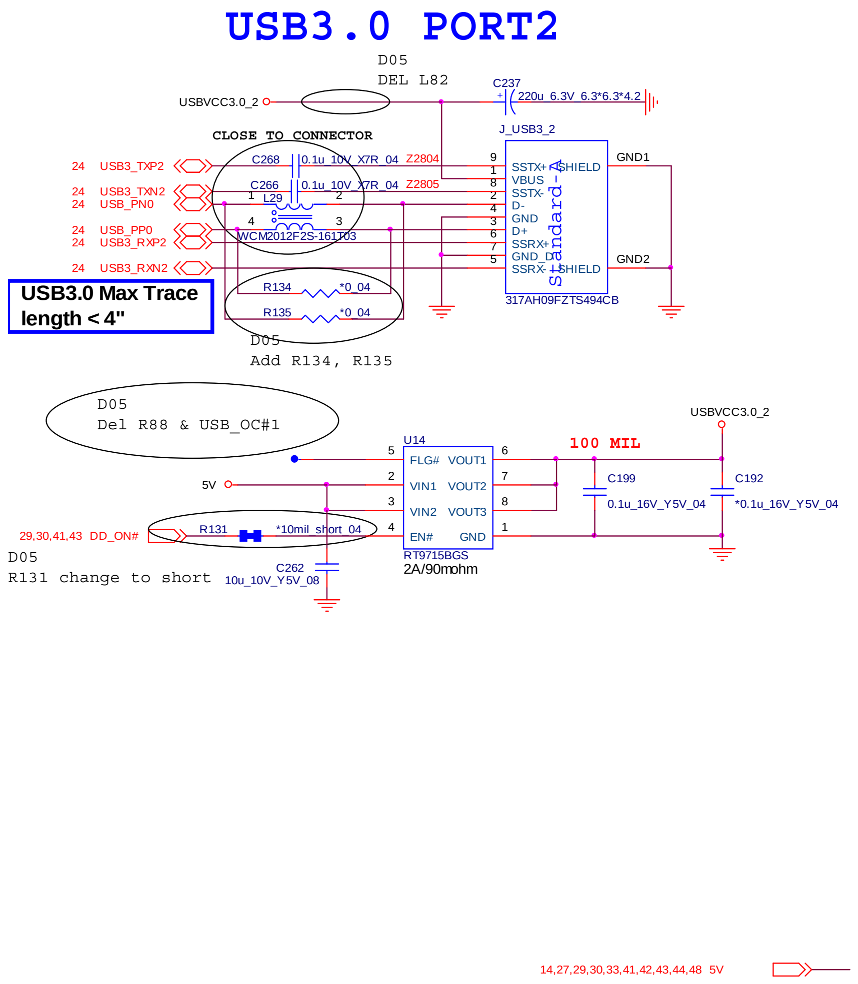
Card Reader RTL8411



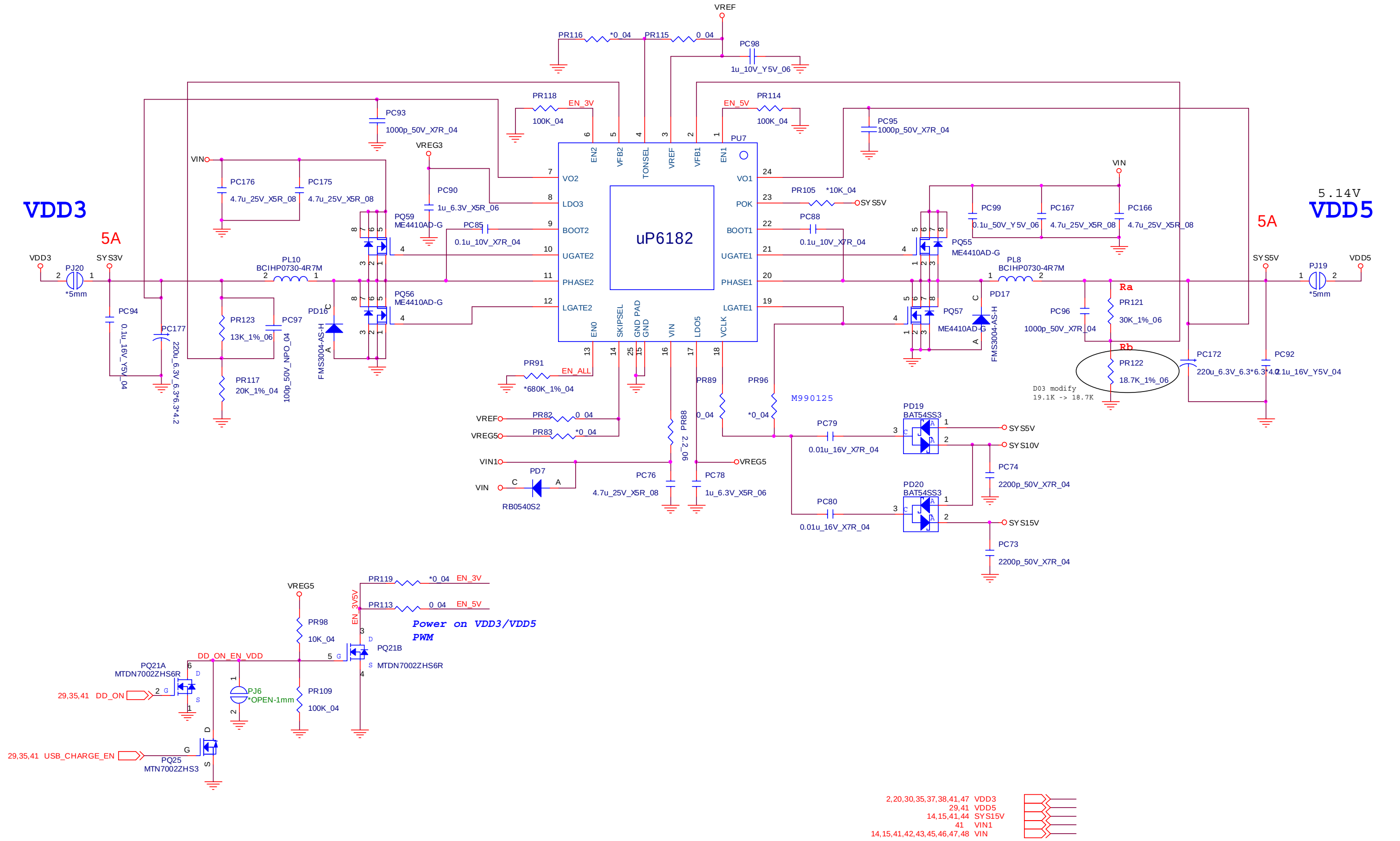
Sheet 38 of 61
Card Reader
RTL8411

USB 3.0

Sheet 39 of 61
USB 3.0



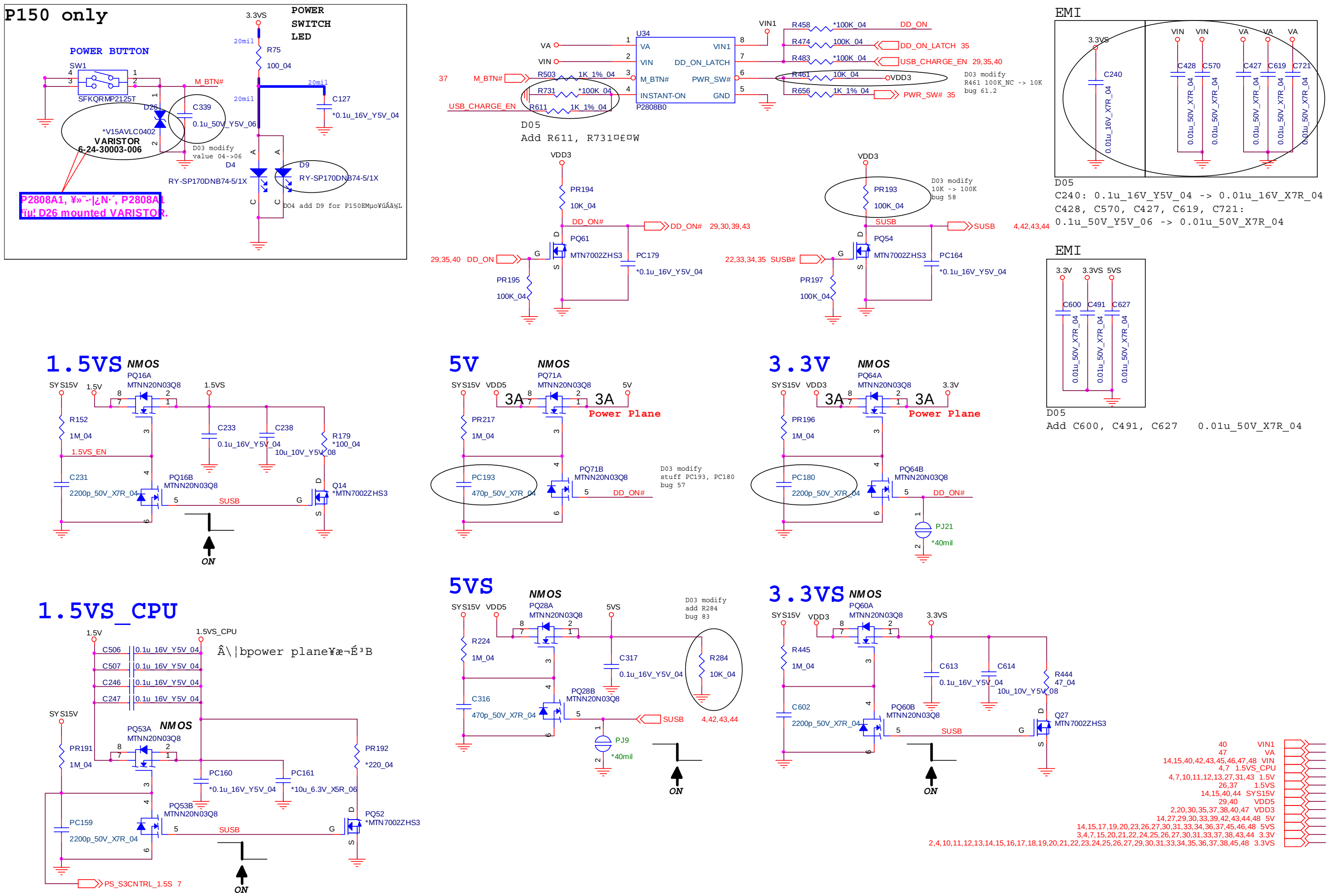
VDD3, VDD5



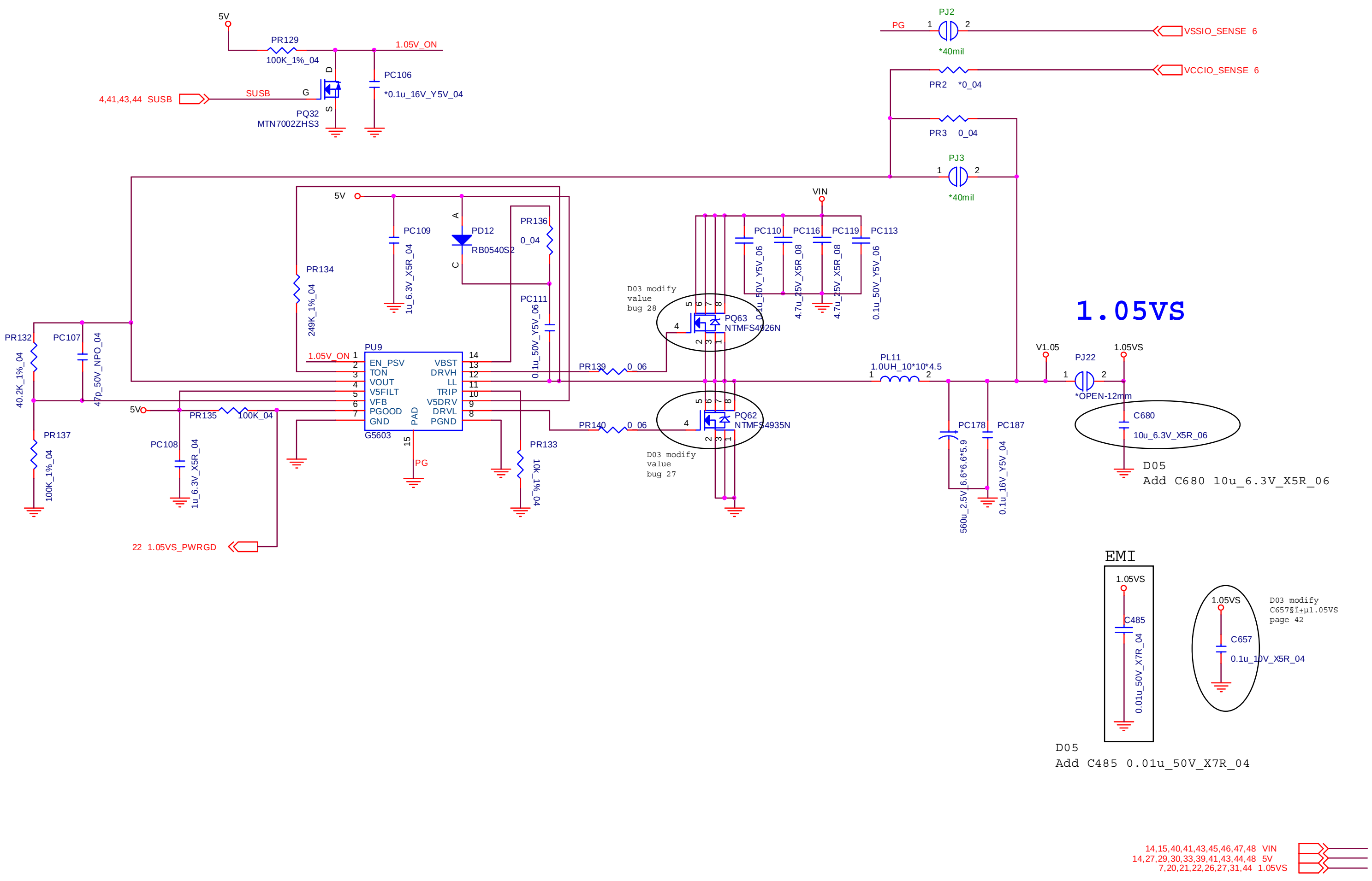
Sheet 40 of 61
VDD3, VDD5

5VS, 3.3VS, 1.5VS

Sheet 41 of 61
5VS, 3.3VS, 1.5VS

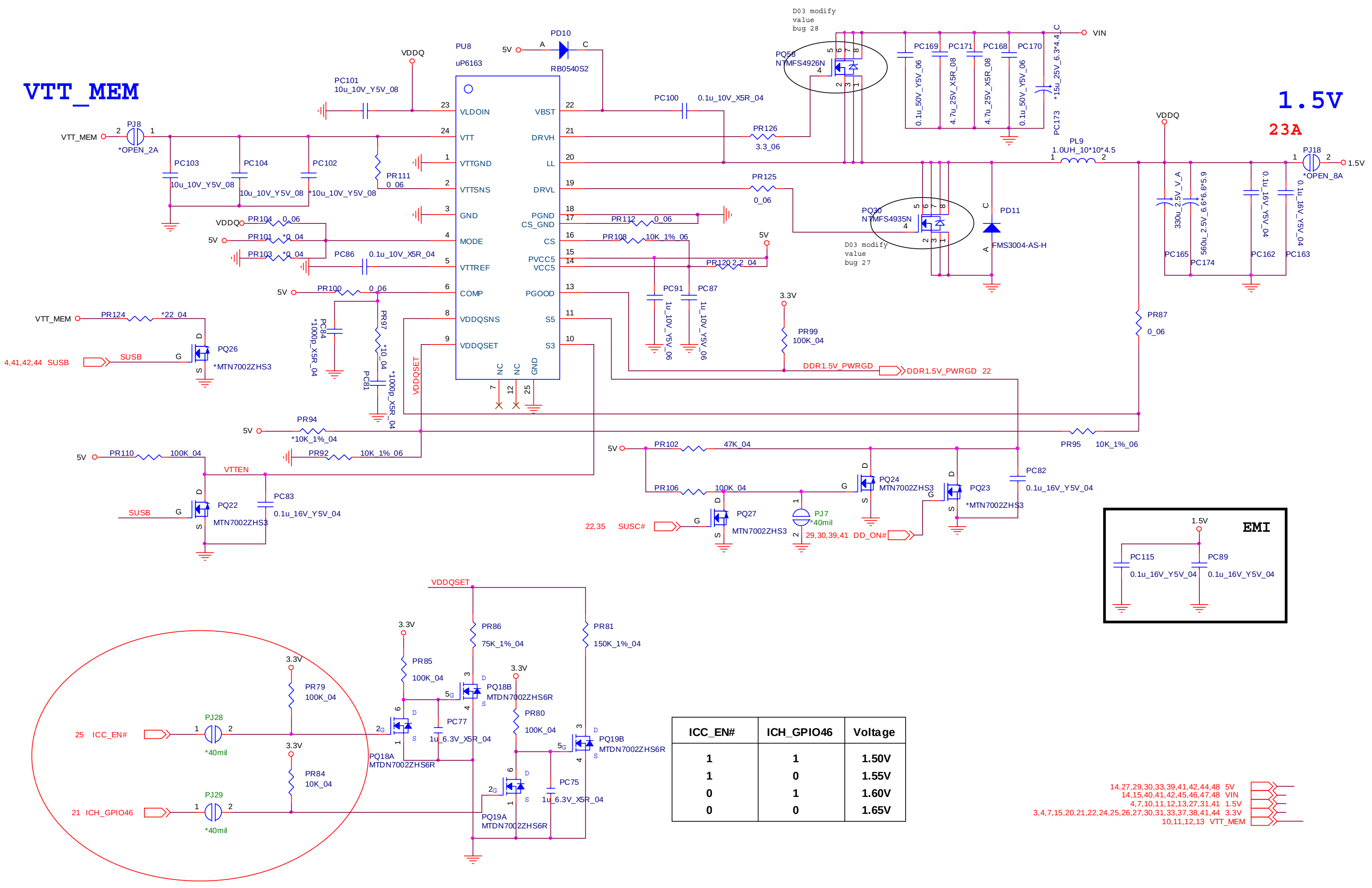


Power 1.05VS



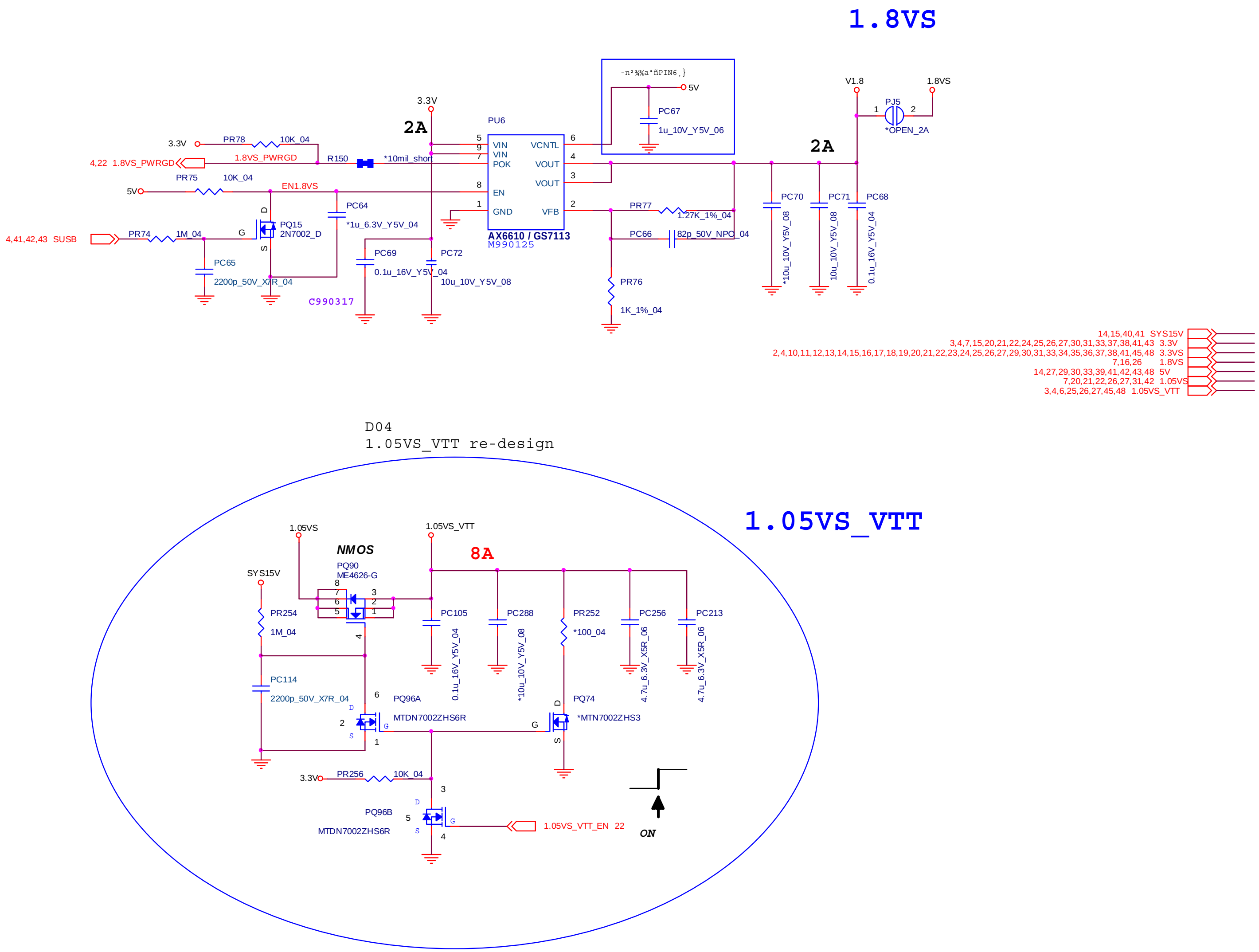
Sheet 42 of 61
Power 1.05VS

Power 1.5V/VTT_MEM



ICC_EN#	ICH_GPIO46	Voltage
1	1	1.50V
1	0	1.55V
0	1	1.60V
0	0	1.65V

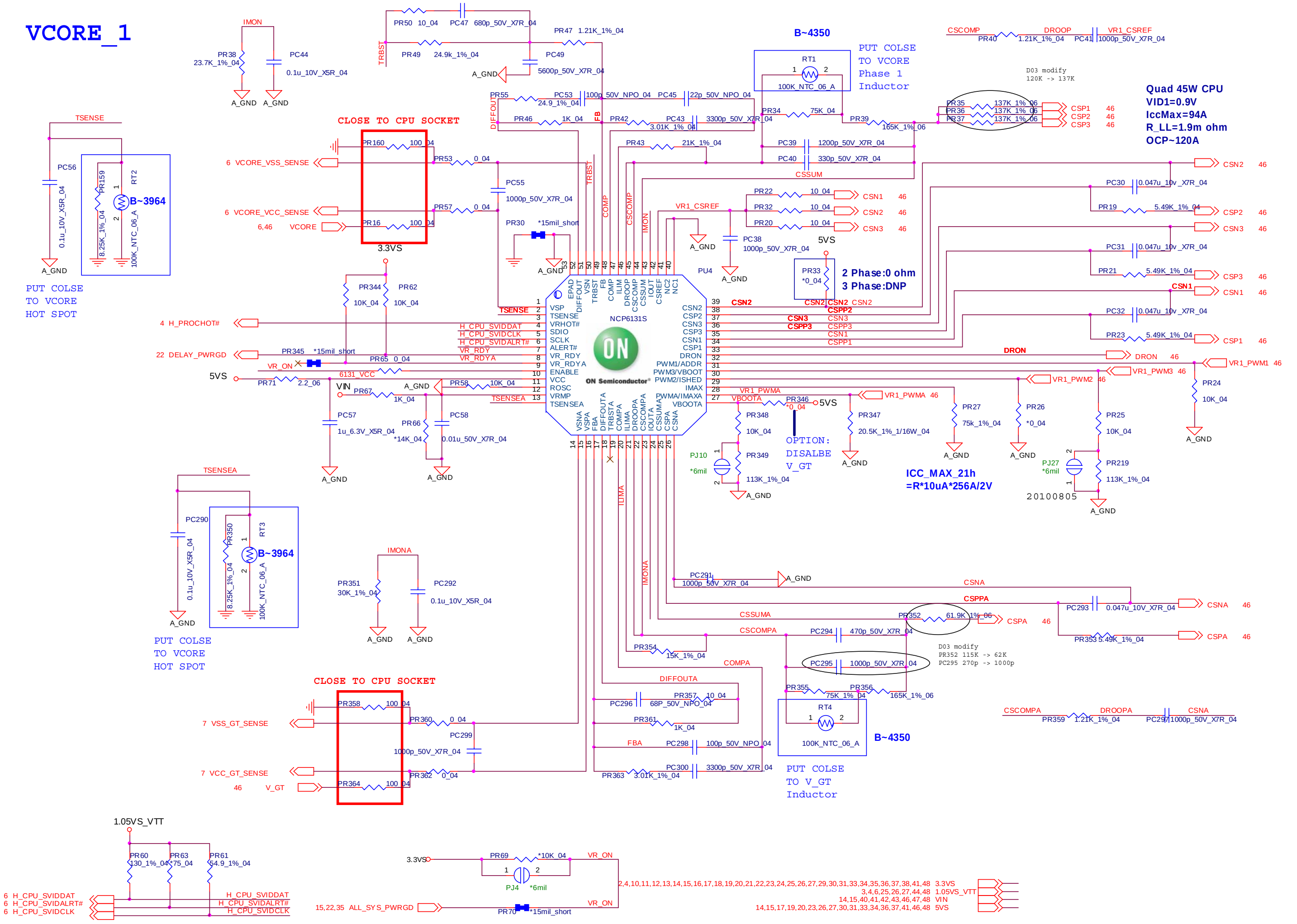
Power 1V, 1.8VS



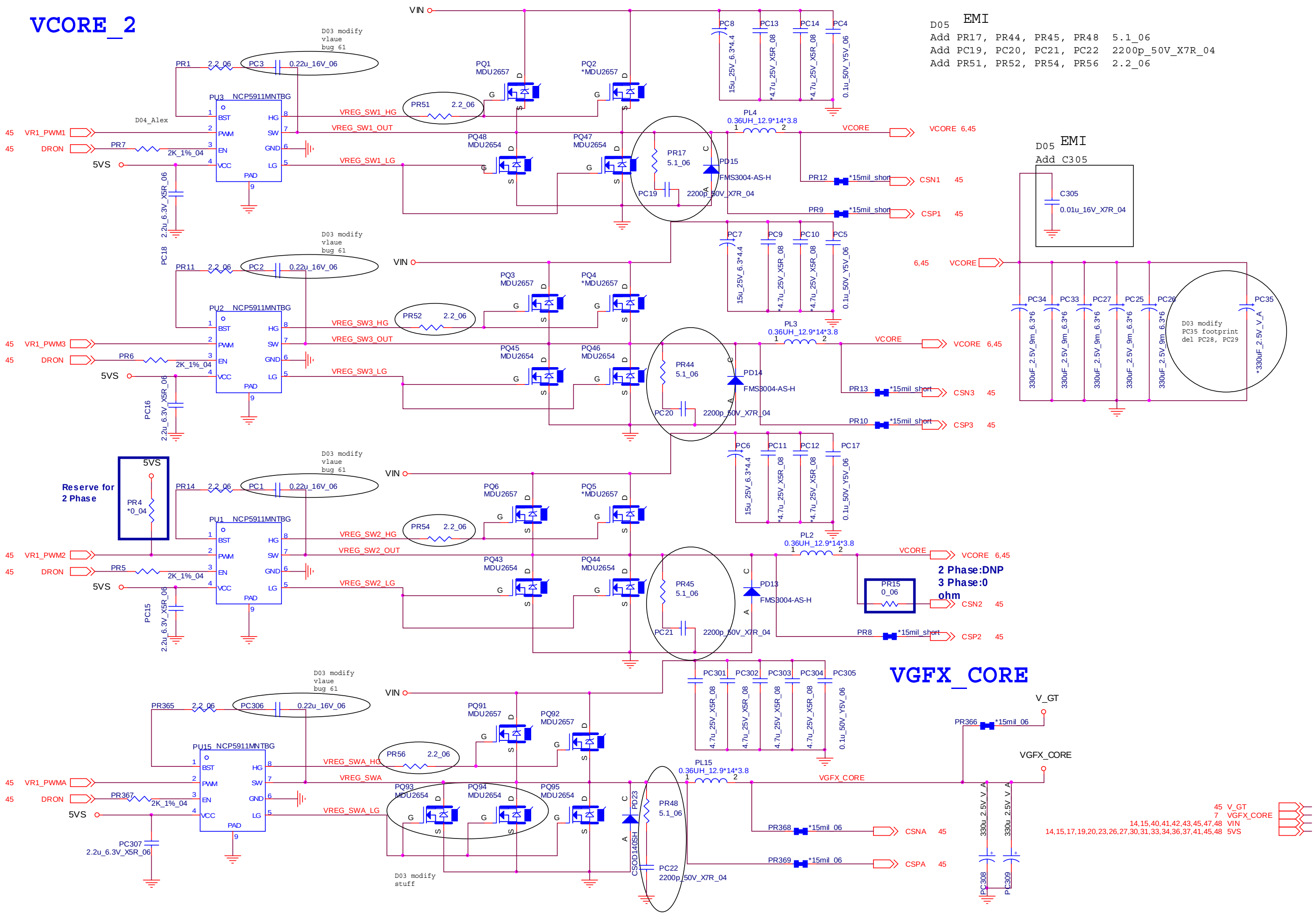
Sheet 44 of 61
Power 1V, 1.8VS

Power V-Core 1

Sheet 45 of 61
Power V-Core 1



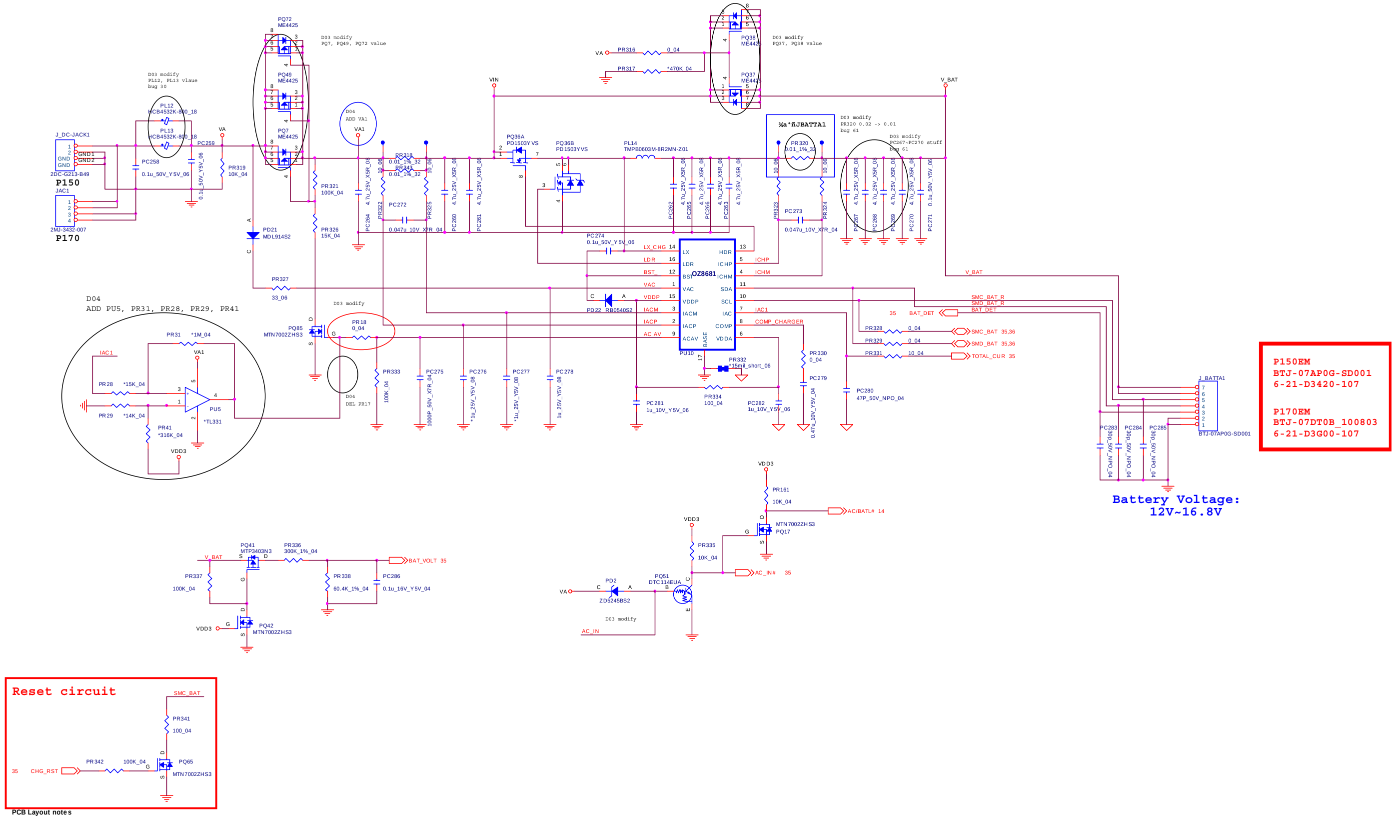
Power V-Core 2



Sheet 46 of 61
Power V-Core 2

AC_In, Charger

Sheet 47 of 61
AC_In, Charger



PCB Layout notes

1) All power traces should be routed on the outer layers
GNDP, VAD, VSYS, LX, VCHG, VBATT

2) Use Kelvin connections for R3, R4
(seperate force and measurement traces)

3) R23 and R24 are dummy resistors, for layout purposes only
(serves as single point connection between GNDP & GNDA)

4) Footprint TO-236 is equivalent to SOT-23

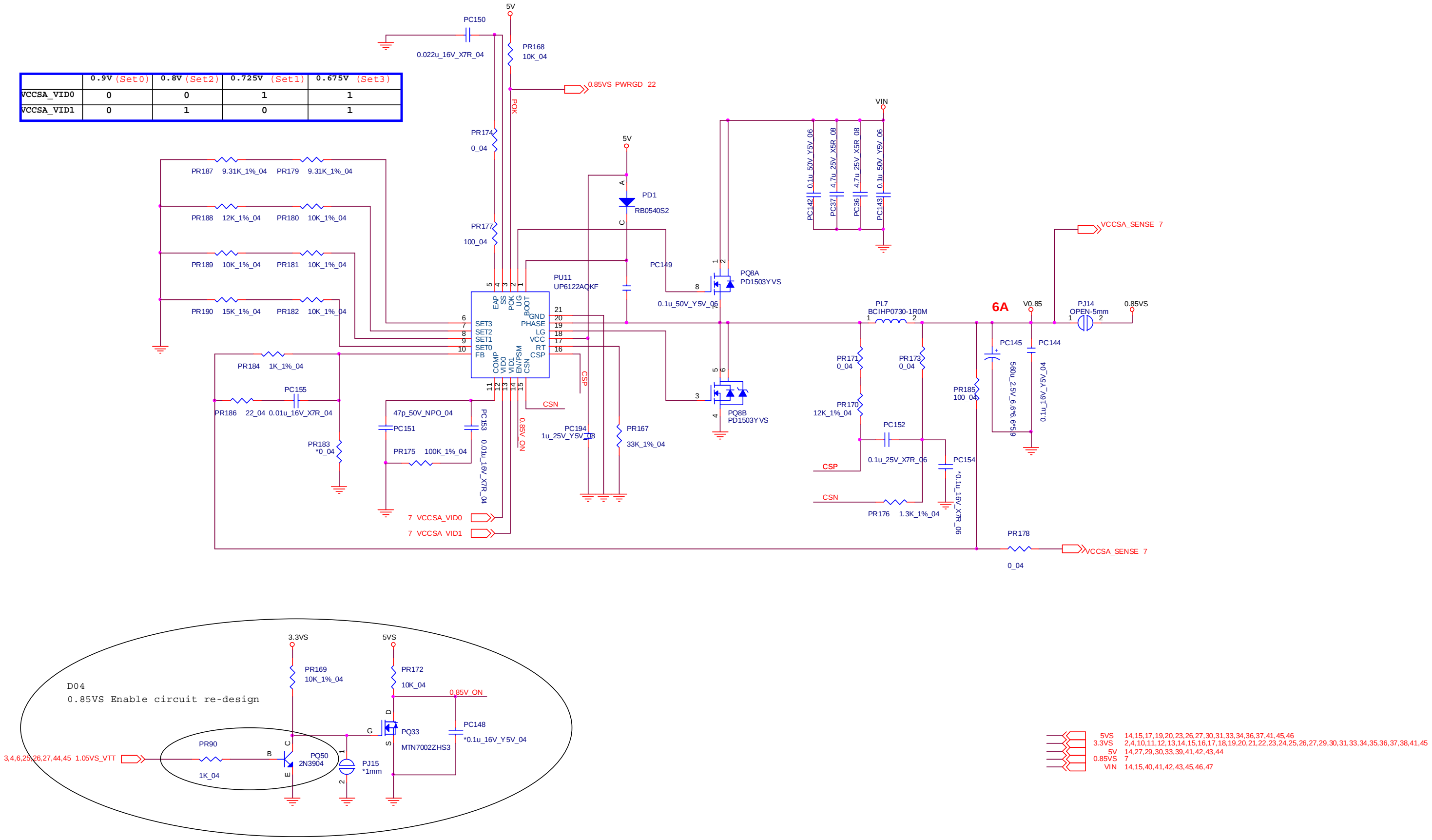
5) Footprint SIP/1P is a single hole axial pad

6) All resisitors, capacitors and semiconductors are SMD

7) Potentiometers, and test points are axial devices

Power 0.85VS

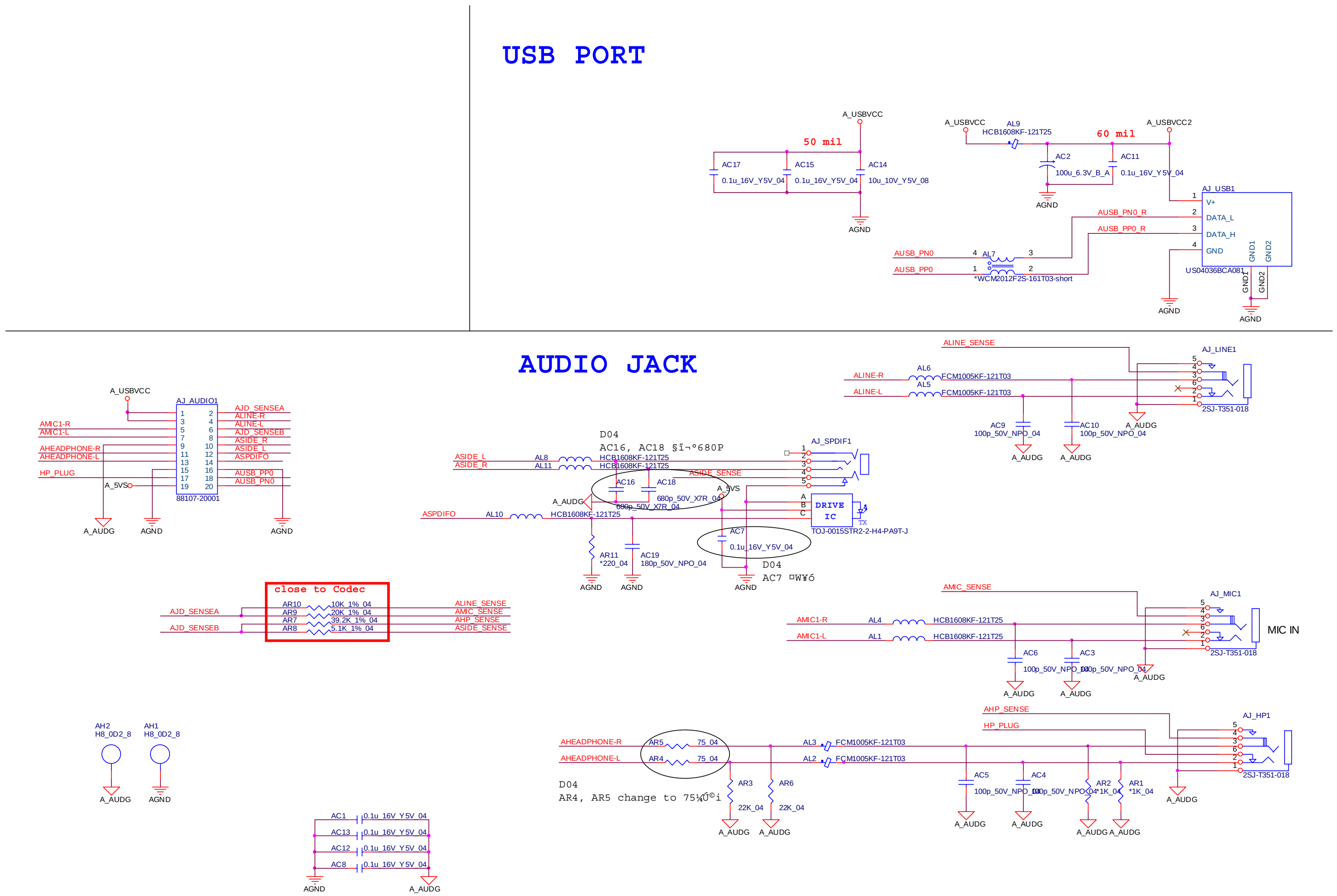
	0.9V (Set0)	0.8V (Set2)	0.725V (Set1)	0.675V (Set3)
VCCSA_VID0	0	0	1	1
VCCSA_VID1	0	1	0	1



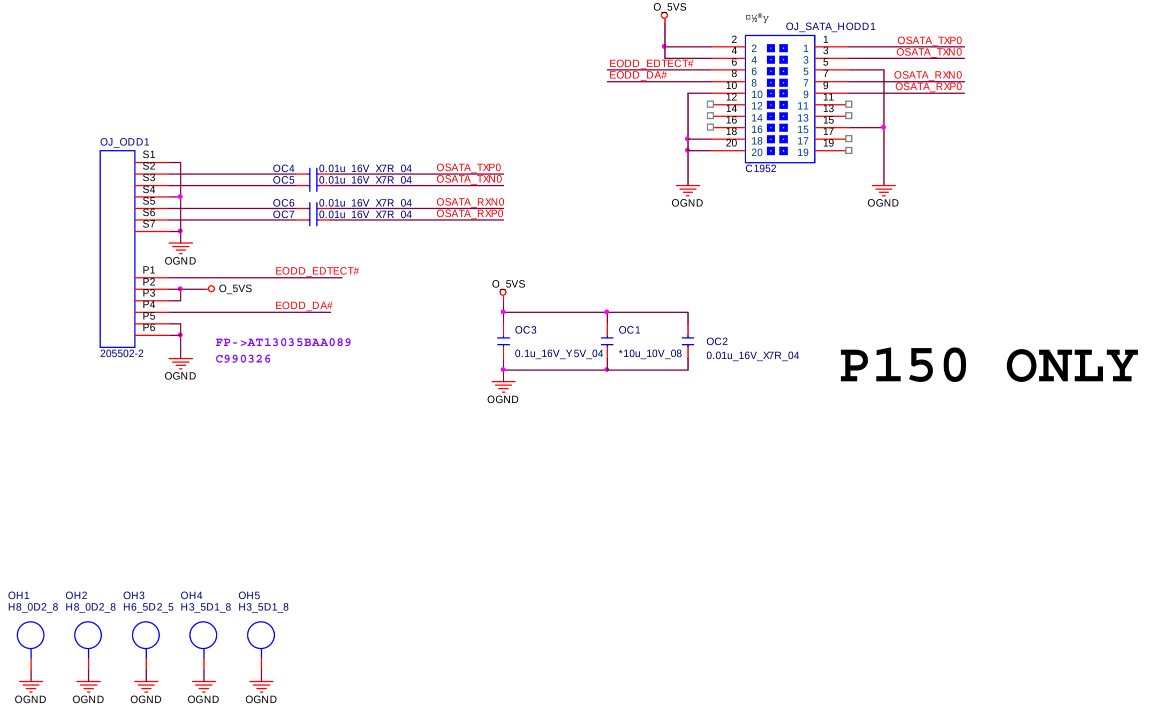
Sheet 48 of 61
Power 0.85VS

Audio Board

Sheet 49 of 61
Audio Board



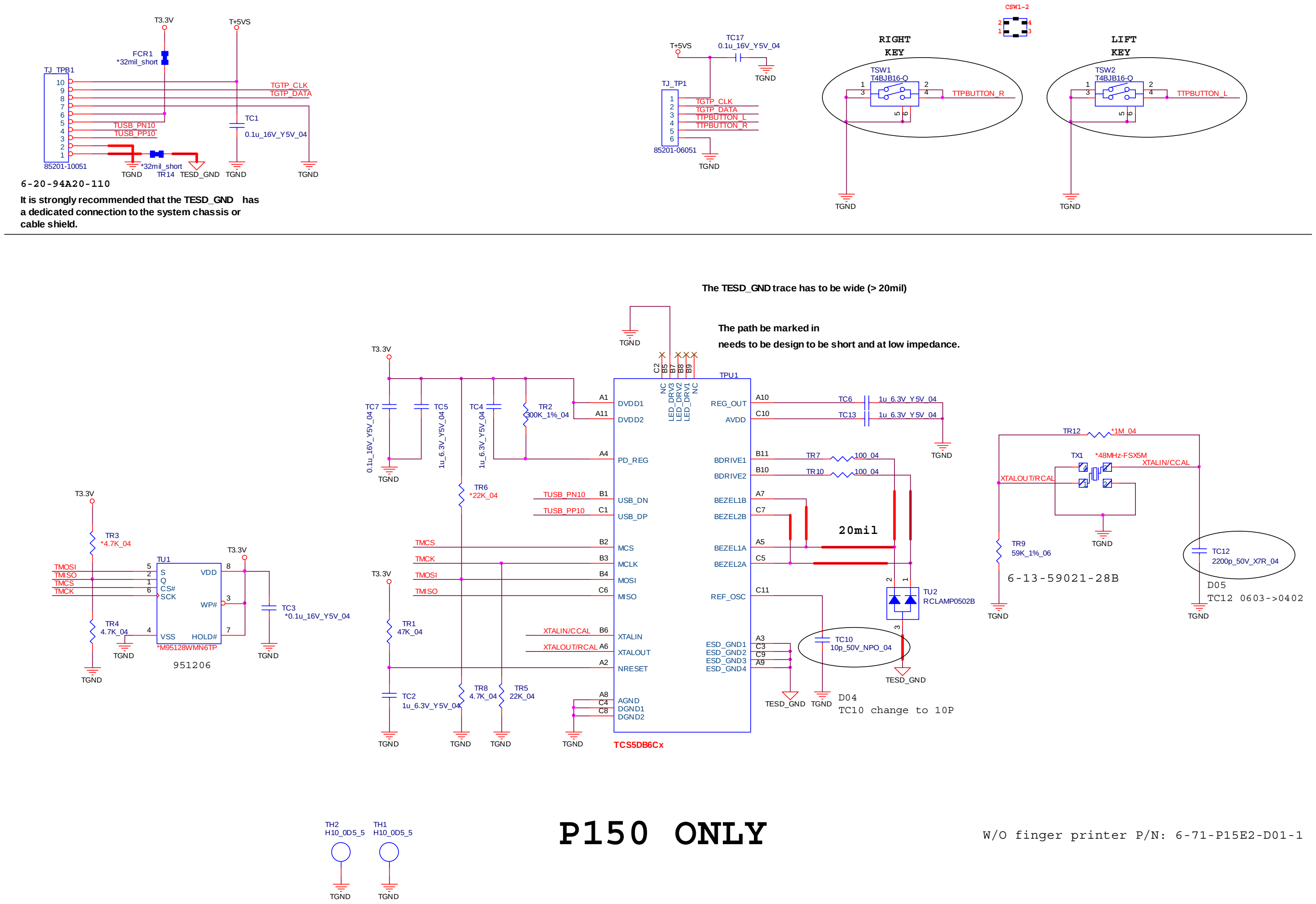
P150 ODD Board



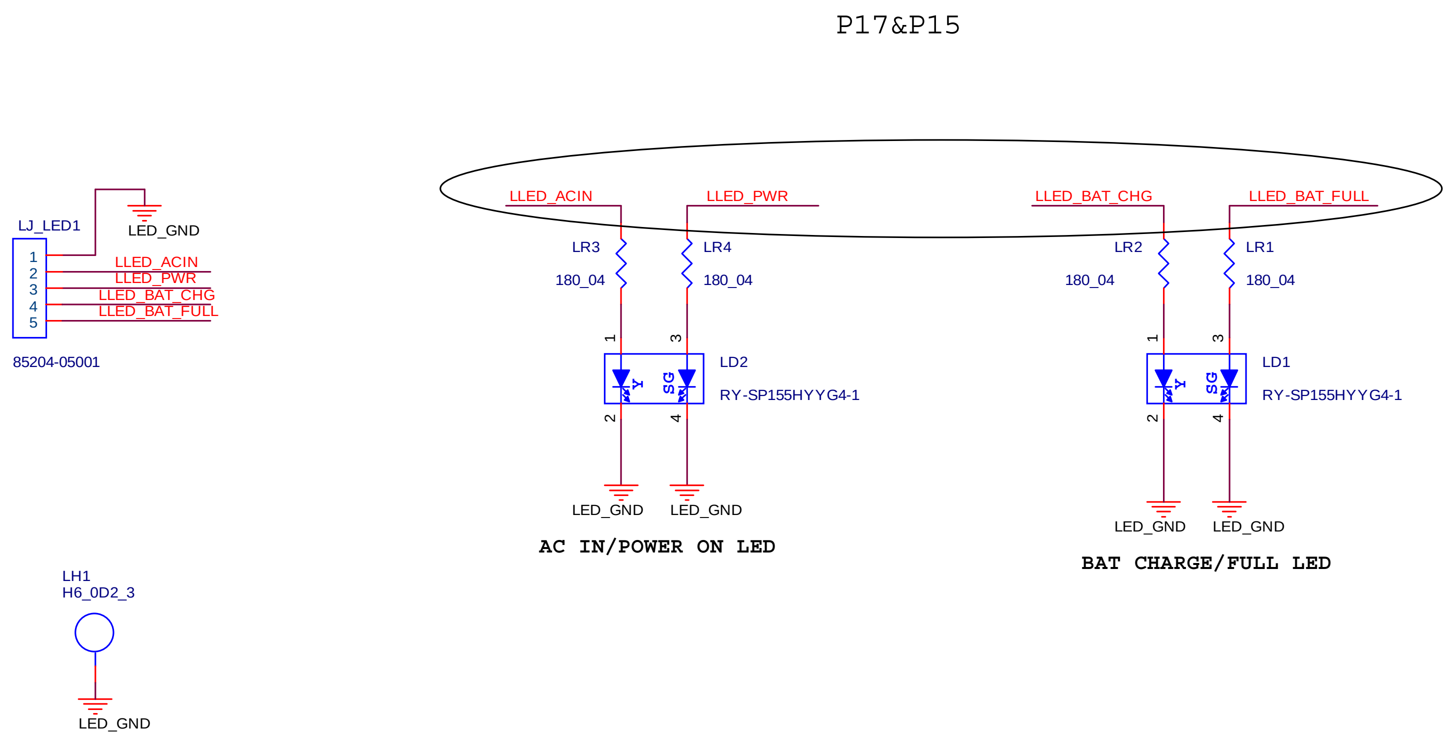
Sheet 50 of 61
P150 ODD Board

P150 Click Board

Sheet 51 of 61
P150 Click Board



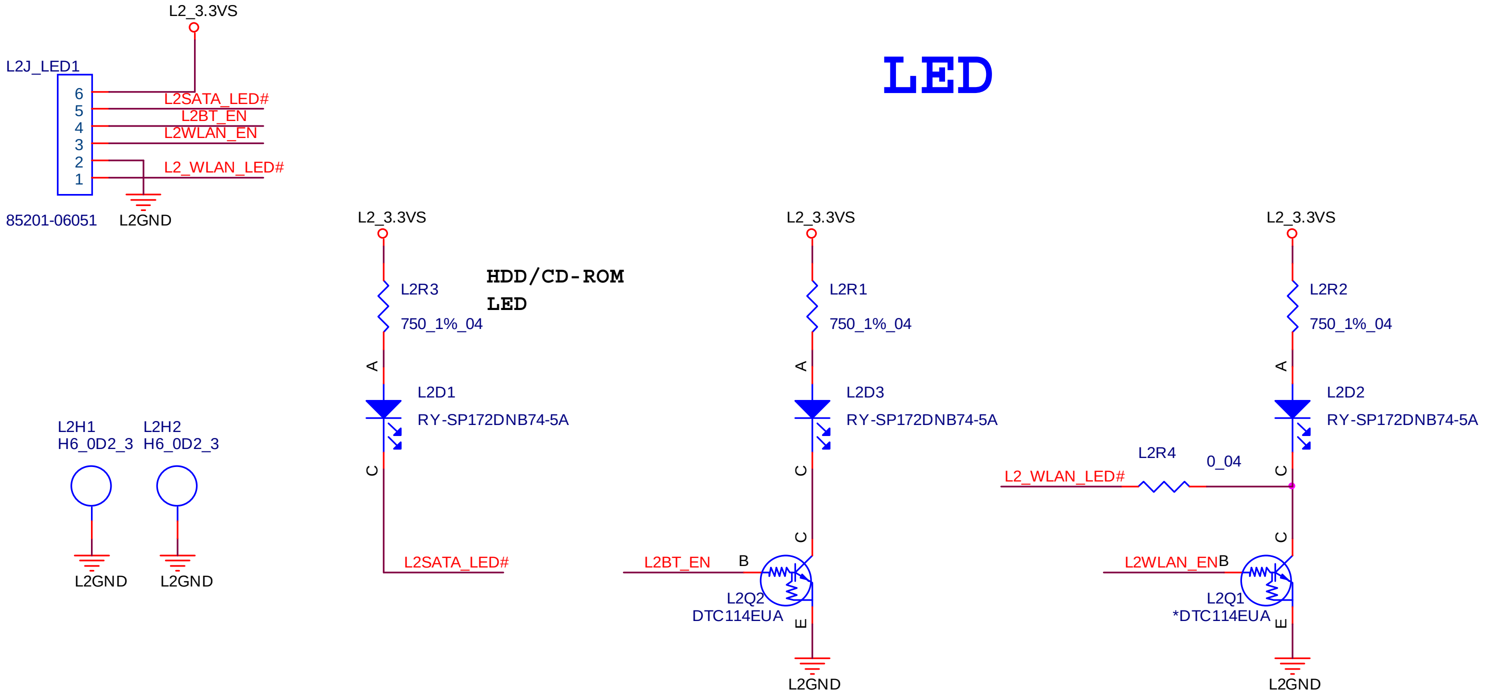
P150 LED 1 Board



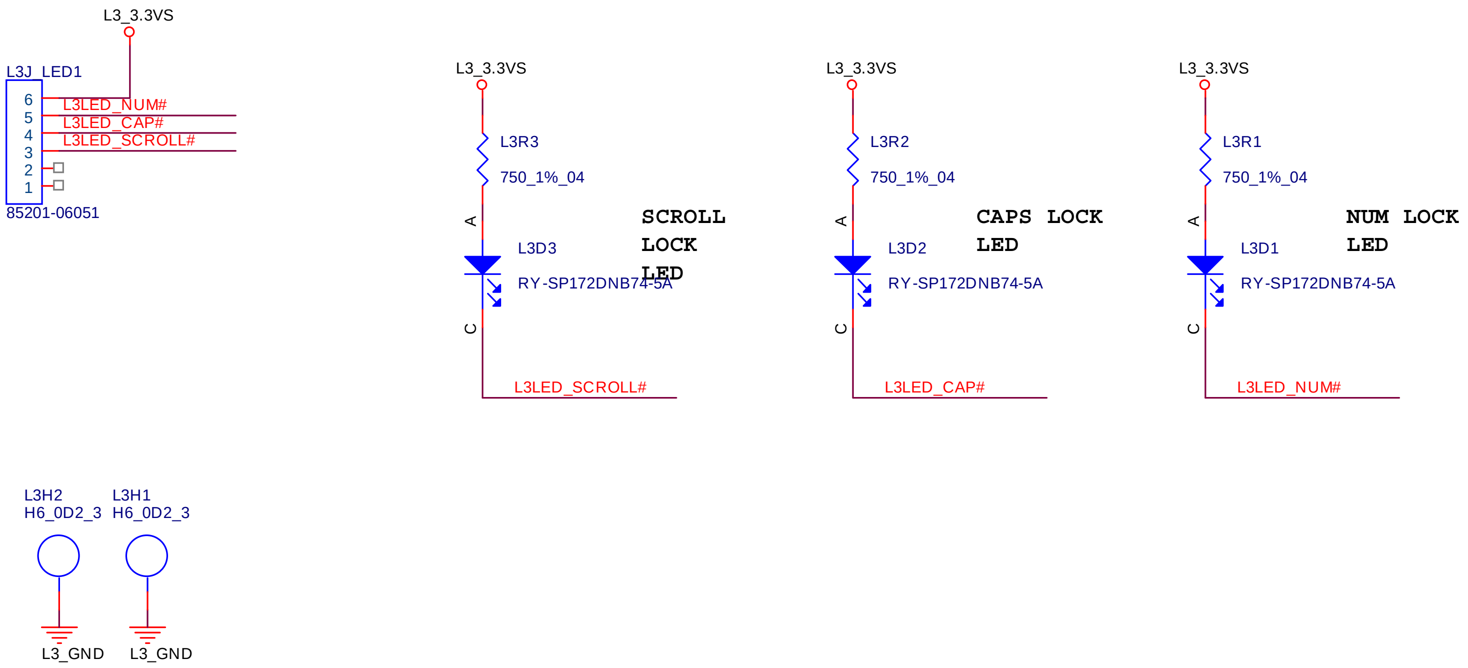
Sheet 52 of 61
P150 LED 1 Board

P150 LED 2 Board

Sheet 53 of 61
P150 LED 2 Board



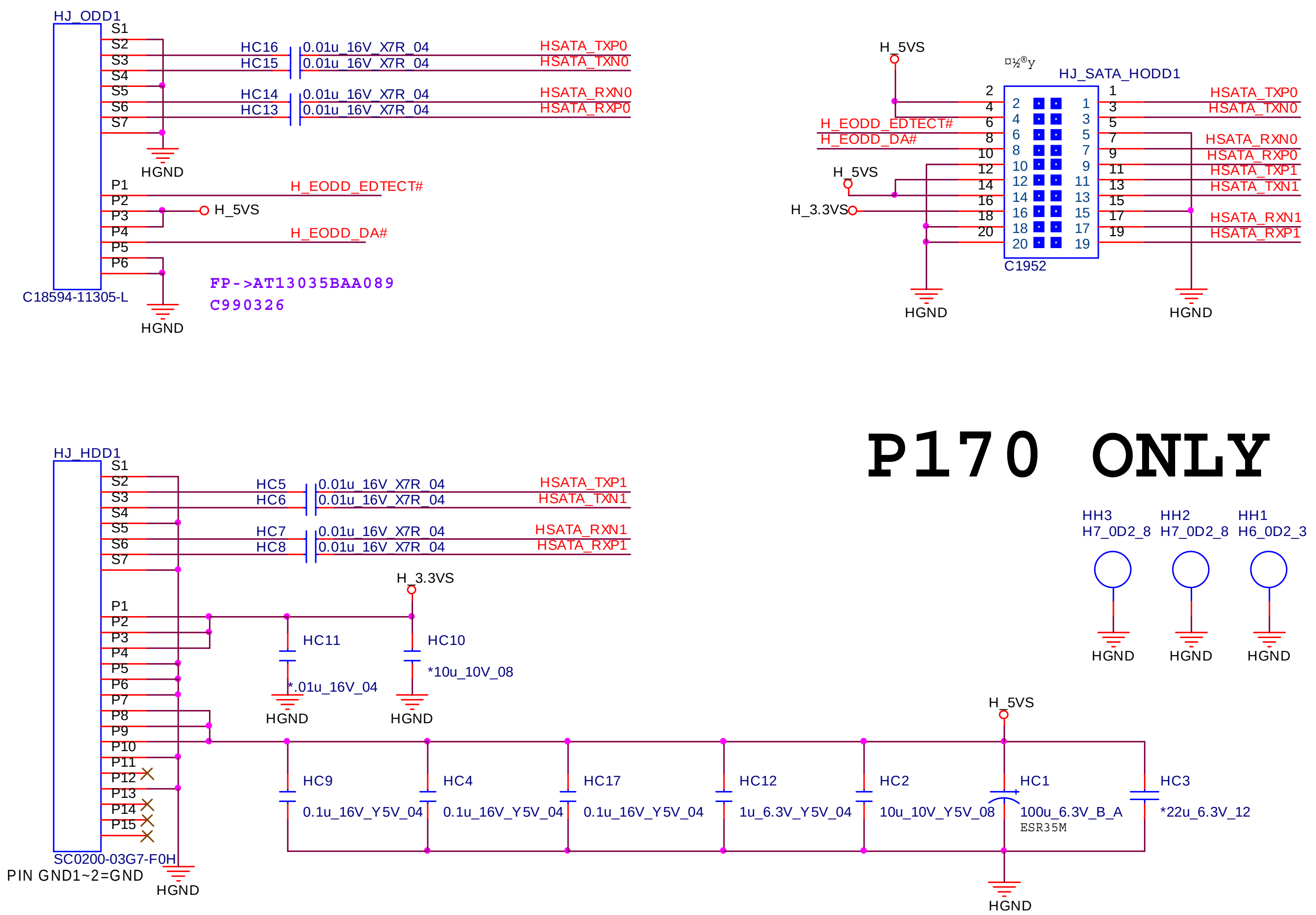
P150 LED 3 Board



Sheet 54 of 61
P150 LED 3 Board

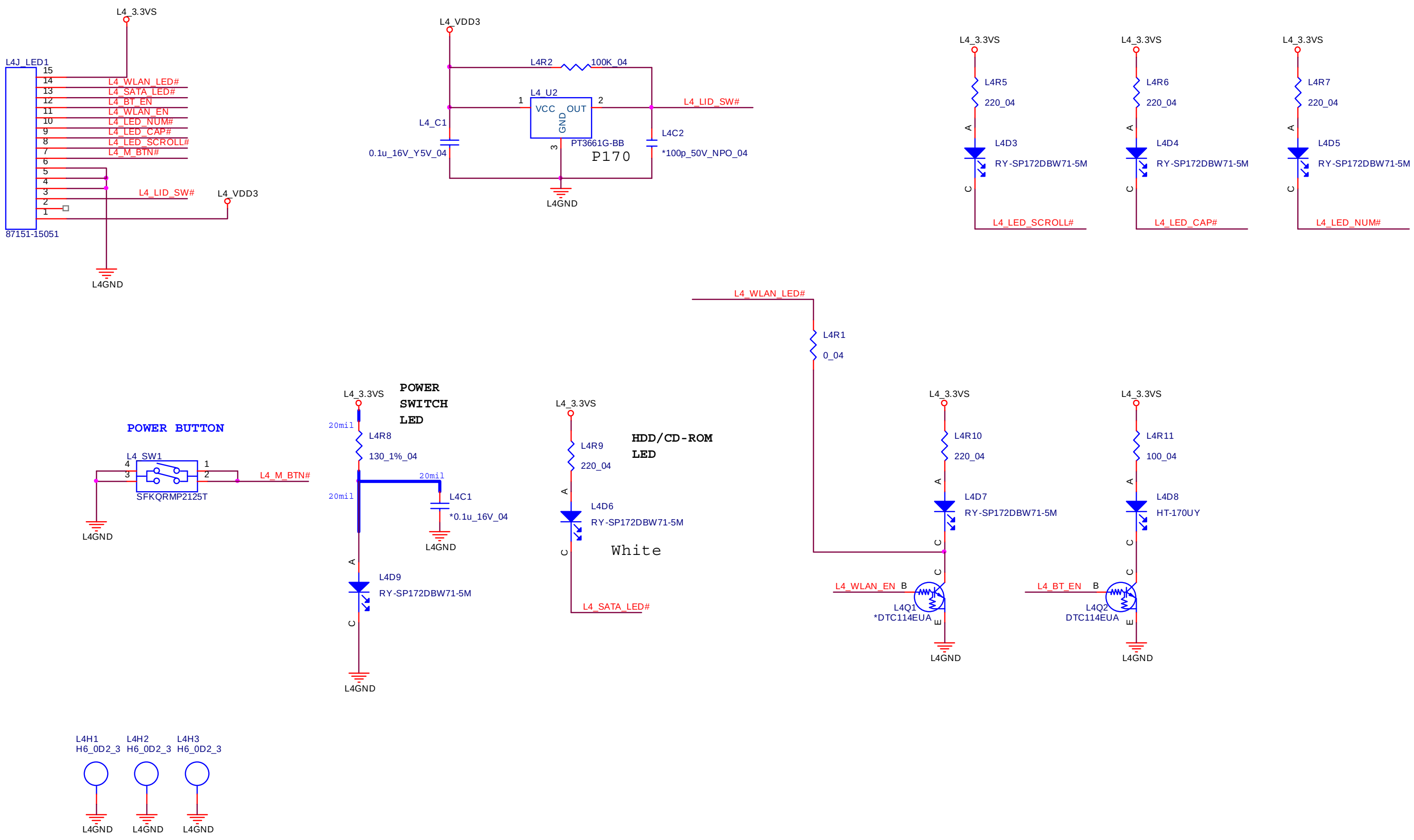
P170 HDD & ODD Board

Sheet 55 of 61
P170 HDD& ODD Board



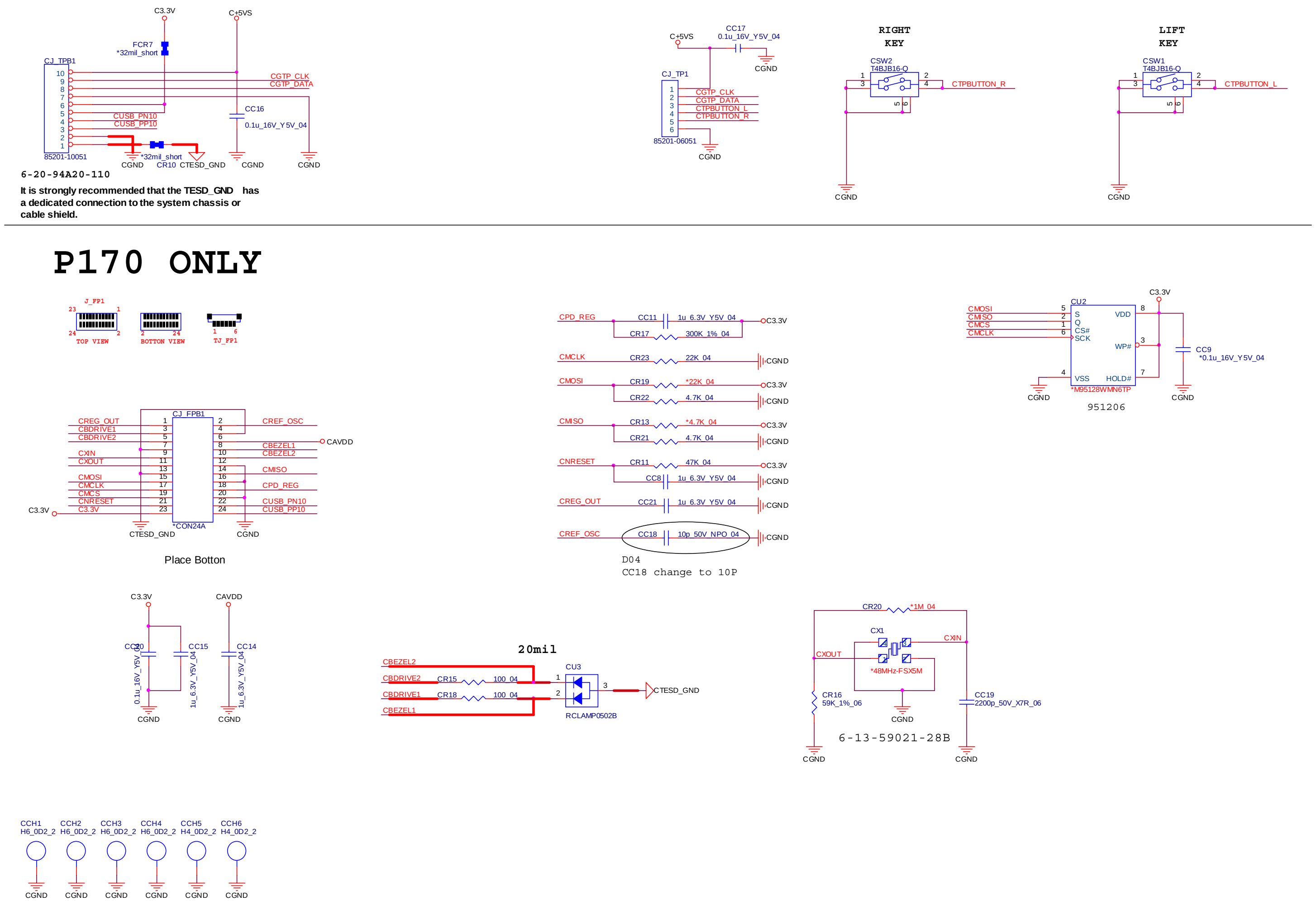
B.Schematic Diagrams

P170 LED Board



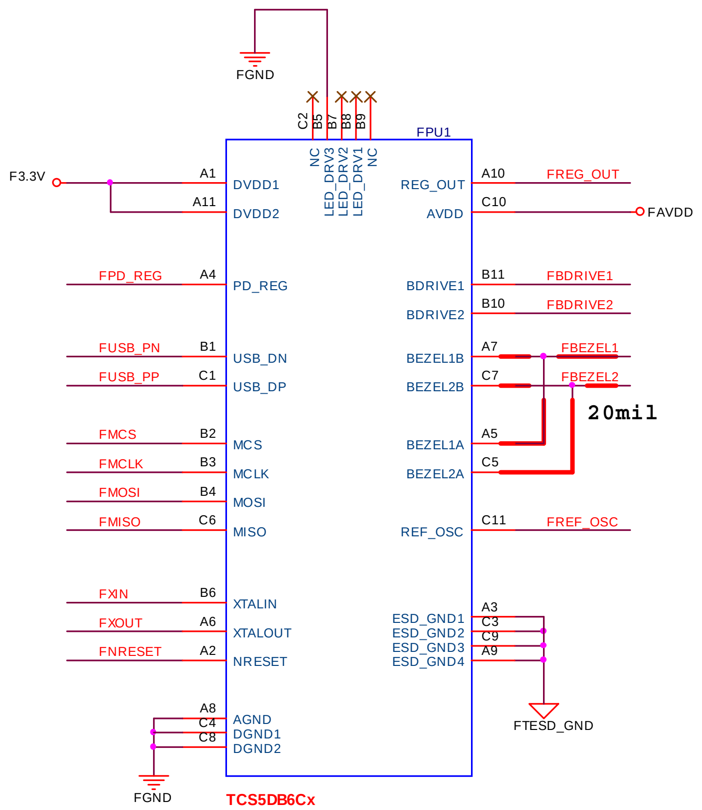
Sheet 56 of 61
P170 LED Board

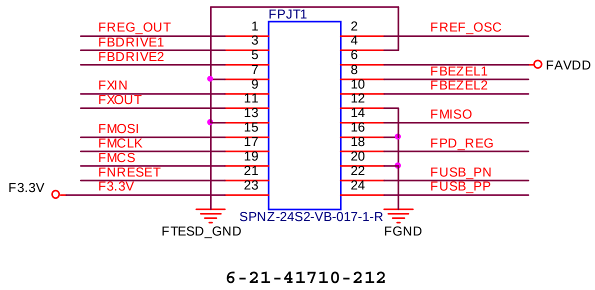
P170 Click Board



Sheet 57 of 61
P170 Click Board

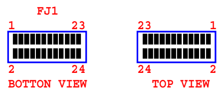
P170 Fingerprint Board





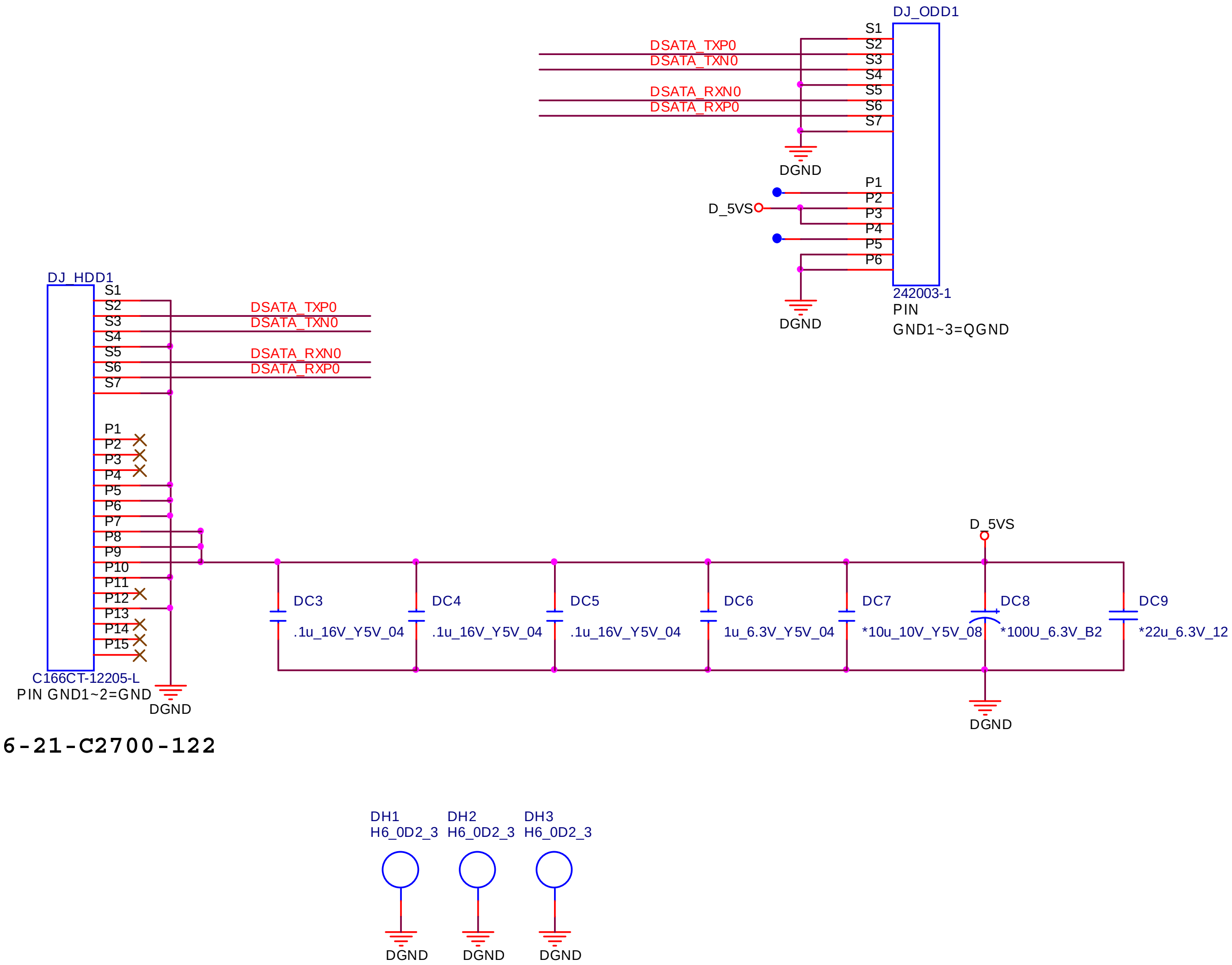
Sheet 58 of 61
P170 Fingerprint
Board

P170 ONLY

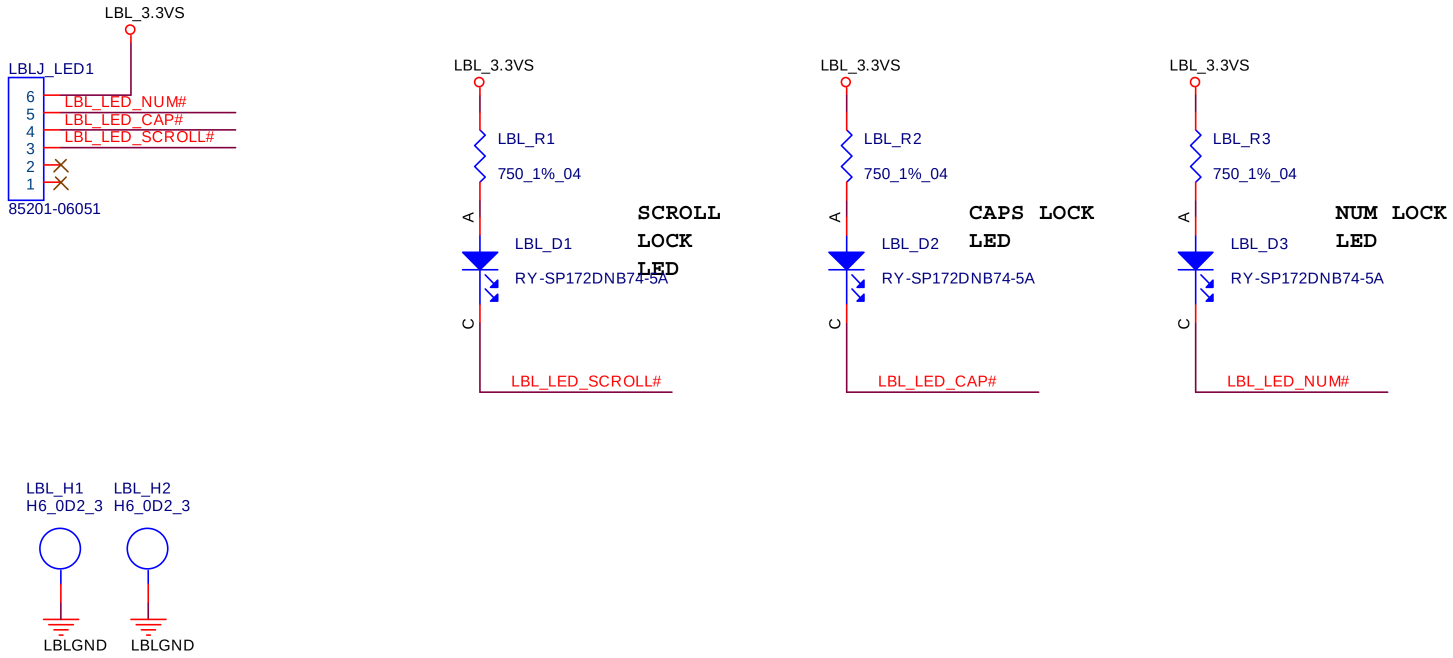


P150 HDD Board

Sheet 59 of 61
P150 HDD Board



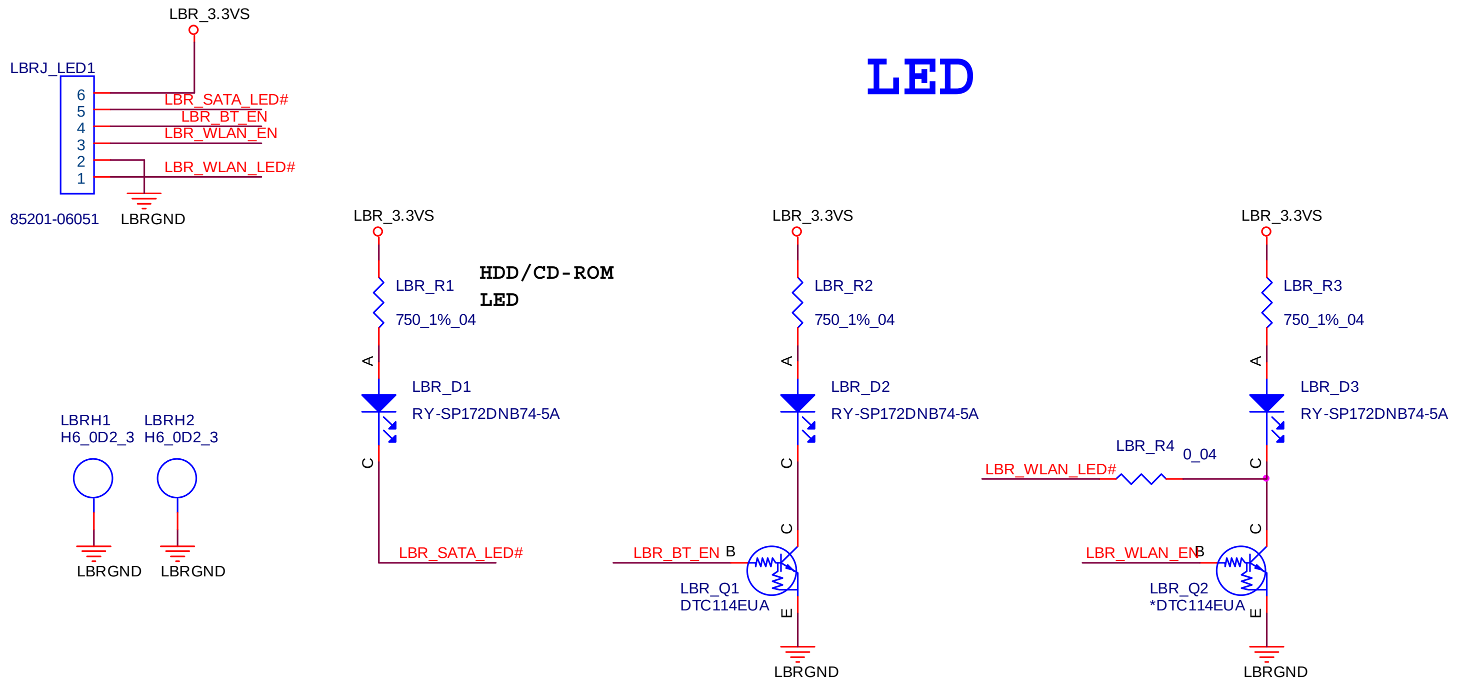
P150 LED Board_L



Sheet 60
P150 LED

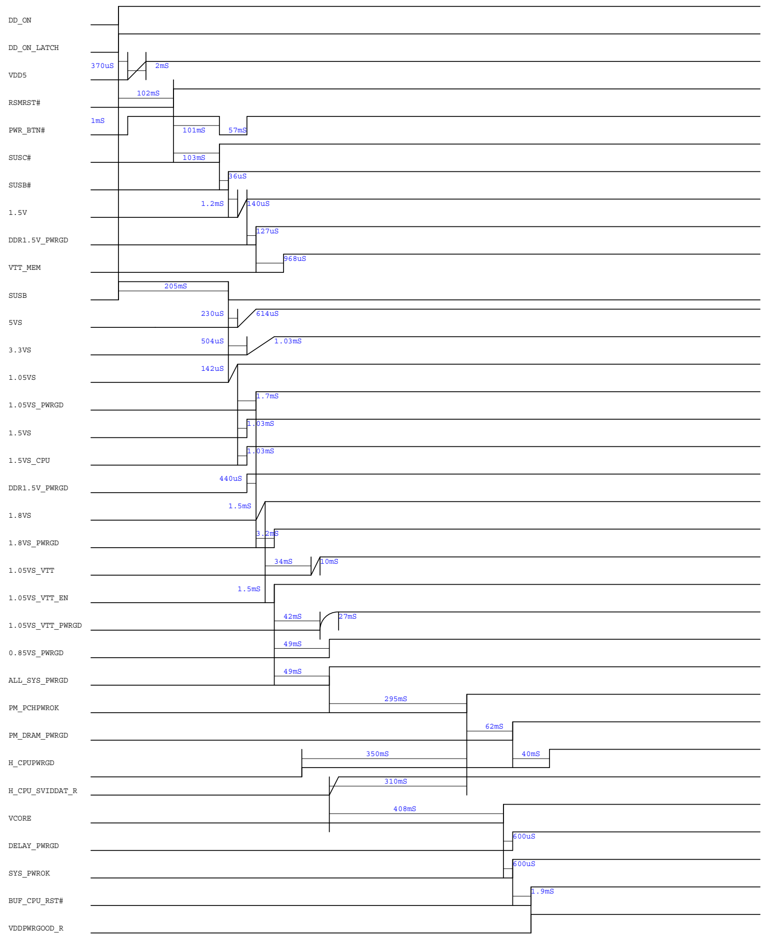
P150 LED Board_R

Sheet 61 of 61
P150 LED Board_R



Power on Sequence

P150EM_D02 POWER on SEQUENCE



Appendix C:Updating the FLASH ROM BIOS

To update the FLASH ROM BIOS, you must:

- Download the BIOS update from the web site.
- Unzip the files onto a bootable CD/DVD/USB Flash Drive.
- Reboot your computer from an external CD/DVD/USB Flash Drive.
- Use the flash tools to update the flash BIOS using the commands indicated below.
- Restart the computer booting from the HDD and press **F2** at startup enter the BIOS.
- Load setup defaults from the BIOS and save the default settings and exit the BIOS to restart the computer.
- After rebooting the computer you may restart the computer again and make any required changes to the default BIOS settings.

Download the BIOS

1. Go to **www.clevo.com.tw** and point to **E-Services** and click **E-Channel**.
2. Use your user ID and password to access the appropriate download area (BIOS), and download the latest BIOS files (the BIOS file will be contained in a batch file that may be run directly once unzipped) for your computer model (**see sidebar for important information on BIOS versions**).

Unzip the downloaded files to a bootable CD/DVD or USB Flash drive

1. Insert a bootable CD/DVD/USB flash drive into the CD/DVD drive/USB port of the computer containing the downloaded files.
2. Use a tool such as Winzip or Winrar to unzip all the BIOS files and refresh tools to your bootable CD/DVD/USB flash drive (you may need to create a bootable CD/DVD with the files using a 3rd party software).

Set the computer to boot from the external drive

1. With the bootable CD/DVD/USB flash drive containing the BIOS files in your CD/DVD drive/USB port, restart the computer and press **F2** (in most cases) to enter the BIOS.
2. Use the arrow keys to highlight the **Boot** menu.
3. Use the “**+**” and “**-**” keys to move boot devices up and down the priority order.
4. Make sure that the CD/DVD drive/USB flash drive is set first in the boot priority of the BIOS.
5. Press **F4** to save any changes you have made and exit the BIOS to restart the computer.

BIOS Version

Make sure you download the latest correct version of the BIOS appropriate for the computer model you are working on.

You should only download BIOS versions that are V1.01.XX or higher as appropriate for your computer model.

Note that BIOS versions are not backward compatible and therefore **you may not downgrade your BIOS to an older version** after upgrading to a later version (e.g if you upgrade a BIOS to ver 1.01.05, you **MAY NOT** then go back and flash the BIOS to ver 1.01.04).

Use the flash tools to update the BIOS

1. Make sure you are not loading any memory management programs such as HIMEM by holding the **F8** key as you see the message “**Starting MS-DOS**”. You will then be prompted to give “**Y**” or “**N**” responses to the programs being loaded by DOS. Choose “N” for any memory management programs.
2. You should now be at the DOS prompt e.g: DISK **C**:\> (C is the designated drive letter for the CD/DVD drive/USB flash drive).
3. **Type the following command** at the DOS prompt:

   C:\> Flash.bat

4. The utility will then proceed to flash the BIOS.
5. You should then be prompted to press any key to restart the system or turn the power off, and then on again but make sure you remove the CD/DVD/USB flash drive from the CD/DVD drive/USB port before the computer restarts.

Restart the computer (booting from the HDD)

1. With the CD/DVD/USB flash drive removed from the CD/DVD drive/USB port the computer should restart from the HDD.
2. Press **F2** as the computer restarts to enter the BIOS.
3. Use the arrow keys to highlight the **Exit** menu.
4. Select **Load Setup Defaults** (or press **F3**) and select “**Yes**” to confirm the selection.
5. Press **F4** to save any changes you have made and exit the BIOS to restart the computer.

Your computer is now running normally with the updated BIOS

You may now enter the BIOS and make any changes you require to the default settings.